The Newspaper of Information Systems Management
September 12, 1994, Vol. 28, No. 37, 174 Pages, $6/Copy, $48/Year

COMPUTERWORLD

SPECIAL REPORT

OPEN SYSTEMS '94

Large U.S. organizations now spend 43 cents of every technology dollar on open systems — 13 cents more than last year. But IS chiefs value interoperability more than standards.

For a special report featuring X/Open's latest worldwide survey, see page 103.

"What are the most important technologies supporting business goals?"

Portable operating systems	82%
Client/server applications	79%
Systems and network security	78%

SURVEY BASE 146 U S EXECUTIVES
MULTIPLE RESPONSES ALLOWED

Source X/Open Co, Reading, England

Novell opens up to Windows

By Elisabeth Horwitt

In a dramatic about-face that underscores the new detente with Microsoft Corp., Novell, Inc. President Robert Frankenberg is jettisoning virtually all product initiatives that compete against Windows, company executives said last week.

Under Frankenberg, the two desktop leaders have taken strides to establish a more congenial relationship — a move that perhaps more than any other signals the end of former Chief Executive Officer Raymond Noorda's era at Novell.

Novell's Robert Frankenberg is expected to spell out a clear product strategy at Networld/Interop this week. Among the key areas of interest for users are products to extend NetWare client/server environments and plans to unbundle and port NetWare Directory Services to other platforms.

Products abandoned

Among the products destined for Novell's dustbin — or at least its back burner — are DOS 7, desktop UnixWare and the AppWare Foundation tools. The latter were supposed to extend the AppWare development environment to non-Microsoft operating systems.

"Windows is the platform of choice on 90% of today's desktops, and we don't want to fight it," explained Kanwal Rekhi, a Novell executive vice president.

Instead, Novell plans to work with Microsoft to integrate two products into the NetWare infrastructure: the Chicago operating system, which was renamed Windows 95 last week (see story page 16), and Object Linking and Embedding, Microsoft's desktop object standard.

"The relationship will not be just on the client side but on all fronts; and we will compete where we need to, openly and fairly," Rekhi said.

While executives provided few details during media and customer briefings last week, users and analysts said they were relieved to hear any kind of coherent strategy from Novell. The network vendor has confused its customers with vague and conflicting directions for the

Novell, *page 14*

Delays plague OS/2 PowerPC

By Ed Scannell
and Michael Fitzgerald

IBM has hit additional technical land mines on the road to developing OS/2 for its PowerPC-based desktop systems, further pushing back the operating system's expected delivery from March to mid-June 1995.

IBM confirmed that its full-function OS/2 for PowerPC is months behind schedule, but it plans to ship a solid beta version by the end of the year. The delay has sparked a debate inside IBM over whether to postpone delivery of PowerPC hardware, which was expected in mid-October.

Corporate users were split over the news: Users at OS/2 shops said they are champing at the bit for the already-tardy operating system but prefer that IBM ship a fully functional product. Other users said they want hardware, regardless of the operating system it runs.

Rival NT

Also problematic for IBM, the delay appears to further open the door for Microsoft Corp., which is currently beta-testing a version of Windows NT for IBM's desktop PowerPCs. The final product is due to ship by December.

With a gap of at least seven months between delivery of the two competing products, some observers said they expect that Windows NT could slow OS/2's chances on the new hardware platform.

"Microsoft beating IBM to market with an operating system for IBM machines is never good," said consultant John Dunkle, president

PowerPC, *page 16*

Exchange trades up via backbone

By Thomas Hoffman
NEW YORK

In an effort to expand its trading capacity, the New York Stock Exchange is overhauling its communications infrastructure with a high-bandwidth fiber backbone. The project is expected to be completed by the end of 1996.

"We want to be in a leadership position, and you have to keep investing to maintain that," said Catherine R. Kinney, executive vice president of equities/audit at the exchange. "We're watching the competitive landscape all the time."

This week, some 100 new X Window System terminals will be rolled out onto the trading floor, where they will be used at display booths and trading posts.

At the project's completion, the NYSE wants to be able to trade up to 2 billion shares each day, Kinney said. The maxi-

Stock exchange, *page 161*

Catherine R. Kinney: *NYSE hopes to trade up to 2 billion shares a day*

DB2 tied to client/server

By Craig Stedman

IBM plans later this month to introduce a new version of its DB2 relational database for mainframes, which sources said will add a variety of badly needed features to make it easier to mix DB2 with client/server systems.

Version 4 of DB2/MVS will not be generally available until the second quarter of next year, according to analysts briefed by IBM. TCP/IP support and other new capabilities should give DB2 a modern sheen and will have many of the advantages now held by Unix databases (see chart).

Rita Nayar, manager of database management services at the Bank of Montreal's systems operations facility in Toronto, agreed that the addition of TCP/IP, stored procedures and other items will

DB2, *page 161*

Coming attractions

New features in DB2/MVS Version 4 include the following:

Feature	Benefit
Stored procedures	Reduces network traffic
Row-level data locking	More data available at one time
CPU parallelism	Splits queries among processors
N-way data sharing	Multiple systems access same data
Concurrent copy	Updates multiple databases at once
Rewritten index manager	Improves cataloging performance

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What's Inside

September 12, 1994

SWITCHES' BREW

ETHERNET AND TOKEN RING SWITCHES dazzle the market now, but ATM is expected to put users under its spell in the future, according to *Computerworld*'s Guide to High-speed Internetworking. *Page 89*. Our Buyers' Satisfaction Scorecard reveals that users prefer hubs over routers because they're easier to use and understand. *Page 101*. Firing Line features SynOptics Communications' LattisCell ATM switch. *Page 98*. **NETWORLD/INTEROP '94** opens in Atlanta this week with LAN and ATM vendors fighting for user mind share. *Page 12*.

NEWS

- **Ralph Ungermann's** new venture aims to drive multimedia to the desktop via low-cost 25M bit/sec. ATM. *Page 4*
- Hewlett-Packard has delayed the general release of its next-generation MPE proprietary operating system with new Unix hooks. *Page 6*
- **Microsoft** seeks to promulgate its foundation class libraries and Object Linking and Embedding technology. *Page 10*
- **Oracle** plans to reveal today a scheme to connect users of **wirefree devices**, such as cellular phones, to its relational database. *Page 11*
- Microsoft renames Chicago and will roll out the long-awaited **Daytona** release of Windows NT at Windows World. *Page 16*
- **Storage Technology** will release its Nordique disk array from beta testing this week. *Page 20*
- Bull may beat partner IBM to market by announcing a **four-processor PowerPC** machine. *Page 161*

DESKTOP COMPUTING

- Beta users say they generally like what they see in terms of performance improvements in the version of OS/2 known as Warp. *Page 39*

WORKGROUP COMPUTING

- A blend of **imaging and workflow** products passes a credit check. *Page 47*

ENTERPRISE NETWORKING

- Savings from backbone network consolidations enable the **Bank of Montreal** to develop its automatic teller machine network. *Page 53*

LARGE SYSTEMS

- Storage Technology's **Iceberg** RAID device warms users' hearts. *Page 61*

APPLICATION DEVELOPMENT

- Vendors fill in the gaps at the high end of the **client/server** spectrum with a range of development tools. *Page 67*

IN DEPTH

- The story of an **outsourcing project gone awry** serves as a cautionary tale for the corporate world. The application did too little, came too late and ran $3 million over budget. *Page 135*

CAREERS

- **Moonlighting.** If you've got the skills, moonlighting may be the thing for you. However, it can be a time-consuming commitment. *Page 138*

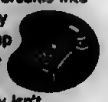
MARKETPLACE

- **Alternative access providers'** prices are competitive, but don't expect huge savings. *Page 147*

COMMENTARY

- **Bill Laberis** says vendors may be surprised by their customers' definitions of open systems. *Page 36*
- **George Shaffner** unveils an overly effective means of measuring high-tech investment. *Page 37*
- **Esther Dyson** says it's a waste of time to look for tomorrow's technology leaders in yesterday's success stories. *Page 37*
- **Stan Schatt** warns that Novell should consider the needs of the many and not assume that all users want a bigger NetWare. *Page 49*
- **Kimball Brown** says it's still early for PDAs, but users can watch for the technology to take off in 1996. *Page 58*

EASTERN EUROPE'S VIRTUAL CURTAIN



Telecommunications problems in Eastern Europe are turning investment dreams into operations nightmares for many U.S. companies that have set up shop there. Five years after the fall of the Iron Curtain, opportunity abounds, but it definitely isn't business as usual. **See page 73.**

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Executive Briefing

The Novell/Microsoft detente was bolstered last week when Novell renounced competition against Microsoft's Windows. Novell also released the first details of its new product strategy. Among the products destined for Novell's hack burner are DOS 7, UnixWare and the AppWare Foundation tools. *Page 1*

In an effort to increase its trading capacity to 2 billion shares per day, the New York Stock Exchange is shifting from a point-to-point Ethernet network to a Fiber Distributed Data Interface as part of a two-year, $125 million systems overhaul. *Page 1*. After years of talk about arming floor traders with wireless handheld devices to more rigorously track their trades, not one of the major financial exchanges has deployed the technology. This has prompted observers to wonder if the holdup is more political than technical. *Page 28*

IBM plans later this month to introduce a DB2 release for mainframes that will include features aimed at bringing its functionality up to par with Unix databases in client/server environments. *Page 1*

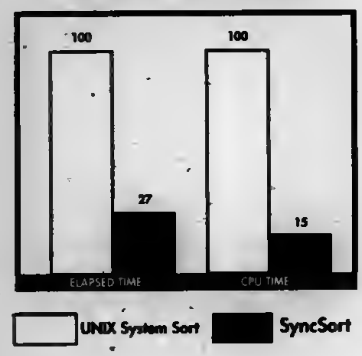
A group of large user companies is taking interoperability into its own hands. The Network Applications Consortium published a white paper outlining its strategy for bringing order to the chaotic world of interoperability standards. The companies, representing about $200 billion in revenue, hope to exert enough pressure on hardware and software vendors through sheer buying capacity. The users hope vendors will work toward having applications, operating systems and network services interoperate. *Page 4*

Open systems are in demand in IS shops. The only problem is the definitions for open systems tossed around by vendors and consortia don't match users' definitions. An X/Open Co. survey reveals that users want their open systems to provide flexibility and vendor independence, even if they must turn to de facto standards. The survey also shows that few corporations can boast of open systems implementations on an enterprise basis. *Page 103*

The 5th Wave *by* Rich Tennant

The UNIX System Sort

PERFORMANCE



FUNCTIONS

	UNIX System Sort	SyncSort
RECORD FORMATS		
Fixed length binary	NO	**YES**
Variable length binary	NO	**YES**
ASCII Text	YES	**YES**
RECORD PROCESSING		
Selection	NO	**YES**
Reformatting	NO	**YES**
Summarization	NO	**YES**
Grouping	NO	**YES**
COLLATING SEQUENCES		
Standard ASCII	YES	**YES**
EBCDIC	NO	**YES**
User Defined	NO	**YES**
Multi-byte	NO	**YES**

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XINU

First Virtual promises affordable multimedia

By Stephen P. Klett Jr.

Chief Executive Officer Ralph Ungermann elicited a lot of industry skepticism two months ago when he announced a new venture to provide Asynchronous Transfer Mode (ATM) products capable of running desktop multimedia applications at switched Ethernet prices.

Last week, Ungermann put Santa Clara, Calif.-based First Virtual Corp.'s money where its mouth is, unveiling 25M bit/sec. ATM adapters, workgroup switching hubs and network operating software designed from the ground up to support end-to-end multimedia applications while meshing with users' LANs.

One of a kind

According to analysts, First Virtual accomplishes a feat no other ATM technology can touch today: It works over standard Category 3 unshielded twisted-pair wiring, which is installed at more than 80% of U.S. businesses today, at prices starting at $500 a seat. Current ATM products require Category 5 or fiber cabling and run from $1,000 to $4,000 per seat. Switched Ethernet prices run from $400 to more than $1,000.

"Ungermann has come up with a very differentiated approach at the very least," said Valentin Sribar, an analyst at Meta Group, Inc. in Reston, Va. "He's taken the generally acknowledged statement that there is no killer [ATM] application that is affordable and stood it on its ear."

"Wow, this technology sounds great. It's very interesting," said Dean Curtis, a multimedia specialist at Metro-Goldwyn Mayer, Inc. and United Artists in Santa Monica, Calif.

First Virtual's *Ralph Ungermann fills in details on his 'differentiated approach'*

Ungermann's brainchild is based on the Multimedia Operating System (MOS), which First Virtual designed specifically to handle the real-time capabilities of ATM. MOS works in conjunction with network operating systems such as Microsoft Corp.'s Windows for Workgroups and Windows NT, Lotus Development Corp.'s Notes, Novell, Inc.'s NetWare and off-the-shelf multimedia applications.

"MOS provides the ability to run real ATM to the desktop without requiring users to change their existing LANs," Ungermann said.

MOS provides the ability to play back, record, edit and direct objects and files containing voice, video and data information over an ATM network.

MOS supports the ATM Forum standards for Class and Quality of Service, but in order to work — in light of incomplete ATM standards such as LAN emulation — it transports ATM cells in a proprietary fashion.

For example, MOS sets up different ATM streams for voice, data and video traffic to deliver all three in real time. Traditional ATM standards interleave ATM cells carrying each type of data. It also uses proprietary software to communicate with users' LAN protocols such as TCP/IP and IPX.

This was a source of concern for some observers, who said they were worried that it may raise compatibility issues with other vendors' ATM equipment and compliance with standards.

Fringe appeal

"First Virtual kind of plays with the idea of how ATM works to get it to work in a prestandards environment," said Jennifer Pigg, an analyst at The Yankee Group in Boston. "It's only going to be the lunatic fringe of the communications world that is going to risk this type of implementation."

According to First Virtual, its reliance on software, rather than hardware, to perform ATM services will allow it to keep pace with standards as they evolve and make upgrades a painless process via software updates. However, some sites eager to arm their desktops with multimedia applications today were not reassured.

"First Virtual sounds good, but the proof is in the pudding," said David Pinkard, technical consultant at Mallinckrodt Medical, Inc. in St. Louis. "Our networks are absolutely vital, and we can't afford to have them go down for a minute. This technology must work the first time and every time seamlessly and robustly, which is always a problem with new technology."

At a glance

Company: First Virtual Corp., Santa Clara, Calif.

Founders: Co-founded last year by CEO Ralph Ungermann, 52, and former Ungermann-Bass employees Allwyn Sequeira, Jeff Leffingwell and Marlis Rosetta, and Accel Partners.

Business plan: Provide ATM products consisting of adapters, switches and network operating system software designed to run multimedia applications.

Delivery: Products are slated for Jan. 1 availability at prices ranging from $500 to $800 per seat.

Third-party support: IBM, Novell, Inc., Lotus Development Corp., Macromedia, Inc., InSoft, Inc., InVision Systems Corp., Conner Peripherals, Inc. and Teleos Communications, Inc. Microsoft Corp. support is forthcoming, according to sources.

Virtual business

As its name implies, First Virtual operates as a "virtual" company. It does not do any of its own manufacturing, relying instead on alliances with other vendors.

For example, Advanced Telecommunications Modules Ltd. in Cambridge, England, will provide the 25M bit/sec. adapters and hubs for First Virtual's MOS software.

While analysts said coordinating each partner's efforts will be a challenge, the end result could be worth the effort.

"The biggest challenge is trying to get everyone to deliver all the pieces and keep everything together over time," said Valentin Sribar, an analyst at Meta Group. "However, it's a new way of doing business, and if [Ungermann] can pull it off, he'll probably be written up in business journals 30 years from now."

Group brings order to interoperability

By Sururhi Mohan

■ Tired of watching the standards fracas from the sidelines, some large user companies have decided to take interoperability matters into their own hands.

The Network Applications Consortium (NAC) — a 25-member group of primarily user companies seeking effective enterprisewide mix-and-match applications — last week published a white paper outlining a strategy to bring some semblance of order to the chaotic world of interoperability standards.

The companies, representing about $200 billion in revenue, are hoping to exert enough pressure — through sheer buying capacity — on hardware and software vendors. The hope is that vendors will heed users' voices and work toward making applications, operating systems and network services work together smoothly.

"We're telling larger vendors, 'Poll us and we'll tell you what we're looking for and even test it for you,'" said Doug Savary, staff director at Nynex Corp.'s engineering construction department in Marlboro, Mass. "Maybe Microsoft will not change, but smaller companies [trying to] decide which APIs to write to will know which direction to go."

Large firms represent a sizable lure for vendors. The companies cannot afford to upgrade every year, so they need standards that will help them preserve their investments and move forward with new applications.

Strategy breakdown

The NAC plans to establish a required standard by following a five-part process:

- Defining the need for a specific set of functions.
- Getting vendors to develop competing application programming interfaces (API).
- Declaring an API winner.
- Moving the API to public ownership so all vendors can build their products around it.
- Letting the vendors evolve the standard API as users need additional functionality in their products.

For example, X.500 is a standard that addresses a large audience by trying to solve enormous problems, said James Brentano, senior technical planner at Pacific Gas & Electric Co. in San Francisco and one of the authors of the white paper. Although many vendors claim X.500-compliance, their products do not necessarily interoperate.

"By addressing a specific need — say, mail client directory access — the NAC hopes to be more successful in a shorter time frame," Brentano said. "The NAC is trying to make key vendors arrive at a de facto standard and let the momentum of the de facto standard bring the rest of the market along."

The NAC can be reached at (415) 972-5933.

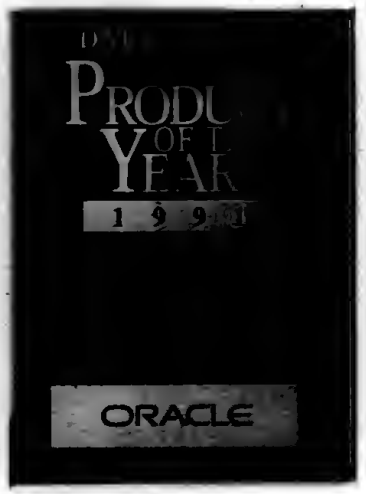
Corrections

Due to a reporting error, Xylan Corp.'s name was misspelled in the Aug. 29 issue.

In a story about Peco Energy Corp. in the Sept. 5 issue, the company where Brian Madden and Marianne Albinese work was misnamed. Both work for CSC Consulting.

Due to an editing error, "Financial message exchange uses upgrade to cut customer charges," [CW, Aug. 22] was a misleading headline. Instead, the computer upgrade by The Society for Worldwide Interbank Financial Telecommunication (SWIFT) was intended to improve system reliability. Also, the name of Auby D. Curtis, manager of SWIFT's Culpepper, Va., operating center, was misspelled.

[1991]



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[1992]

Oracle Case 5.0

[1993]

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Lessons in simplicity

It's not uncommon to find an IBM System/36 plugging away if you are wandering around small manufacturing sites or businesses.

Between 1983 and 1988, IBM shipped 300,000 System/36s worldwide. An estimated 150,000 to 200,000 are still running despite the fact that they are approaching an infirmary-home age in terms of computer life. The System/36 is a Model T that refuses to be replaced by sleeker models — an old workhorse that refuses to die.

How can there be so many System/36s still around when they haven't been produced for six years and there are no hardware upgrades for them? The answer lies in the fact that not all computer users are driven by advances in technology. To some, the familiarity and knowledge they have with their system is a business asset with which they do not wish to part.

"It's never crashed," says Wendy Willis, assistant administrator in the city of Phoenix's Street Maintenance Division, where a 7-year-old System/36 Model 5362 runs the street repair request system.

Customers will refuse to be technically driven until their business needs dictate the move.

Charles Babcock

"Ours is starting to get bogged down," says Darin Anderson, data processing manager at the House of Schwan, a beverage distributor in Wichita, Kan. "But it doesn't crash."

Reliability is the watchword for the System/36 and so is ease of use. Granted the System/36's RPG programming language was odd and almost undecipherable to the unpracticed eye. But it was succinct, and the System/36 would run RPG programs without a hiccup.

Customers liked the low personnel costs of the System/36's SSP operating system, with its embedded security and on-line help. "System utilities did much of the work for you," says Steve Early, manager of IBM's 3x product line.

In the complicated IBM product line, the System/36 represented simplicity as well as reliability. It captured IBM's small business customer, the local manufacturer, the mom-and-pop store, the struggling small business — which is another reason why they are still around. Once in the door, they became the only computer anyone had time to invest in learning.

"I'm not a computer person. I never have been. . . . I've had very little training. It's just living with the damn thing," Willis says. Anderson has taken a trade school course in RPG programming; Willis has no formal RPG training.

This of course frustrates the planners and product-line managers for the AS/400, the processor series to which System/36 users were expected to migrate. "They're not technically driven. They're just focused on running their business," said Bill Zeitler, marketing manager for the AS/400.

Although many System/36 shops continue to resist the migration, they are being left deeper and deeper in a technological Stone Age. Ed Browning, sales manager at Informed Beverage Management, a System/36 and AS/400 software firm in Charlotte, N.C., says he wishes his System/36 customers would make the move so they can get the benefit of applications written for the AS/400. And while IBM says it converts some each year, Browning predicts a "hard core" will still be using System/36s several years from now.

Anderson says the House of Schwan is preparing to migrate to an AS/400. (SSP programs are slated to run on a future model.) Willis says her division is not. It's moving to a PC LAN.

IBM's experience with the System/36 should serve as a reminder to all vendors who think a customer base will upgrade as rapidly as the product line can be driven forward. In many cases they will — when there is a trade-off between gained productivity and expense. In others — Intel's interest in moving customers to Pentiums from 1486s and 386s comes to mind — the customer will refuse to be technically driven until the business need dictates it.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737

HP delays MPE/IX 5.0

By Mark Halper

■ Hewlett-Packard Co. has delayed this month's general release of its next-generation, more open version of the MPE/IX operating system until early next year.

The delay of MPE/IX 5.0 means HP 3000 minicomputer users who expected to receive enhanced Unix hooks and database connectivity will have to wait, although they can still purchase preliminary versions. Those most likely to feel the pinch will be the leading-edge customers among MPE's 67,000 users.

Several HP 3000 users expressed disappointment because they are eager to tap features such as 5.0's support for Microsoft Corp.'s Open Database Connectivity (ODBC). ODBC augurs needed improvements in PC access to the 3000's database, said Bob Lewandowski, vice president of systems at ASAP Software Express, Inc. in Buffalo Grove, Ill.

"The general release was supposed to be this fall; I was expecting to see it by October," Lewandowski said. "I'm disappointed because there are some definite benefits in 5.0."

Running behind

HP is leading the pack in the computer hardware business. But when it comes to operating systems, it blends into the crowd in one noticeable manner: it is late. In addition to the MPE/IX delay, the company is pushing back availability of its next HP/UX Unix operating system.

On the bright side

In a possible silver lining, HP product manager George Stachnik said HP will further open MPE/IX 5.0 by adding support for the Open Software Foundation's Distributed Computing Environment (DCE) after the operating system's general release.

DCE is a set of remote procedure calls and interface specifications intended to ease interoperability in mixed proprietary, Unix and PC shops. Stachnik described DCE support as a huge undertaking for HP. Although the DCE infrastructure will be in 5.0 when the general product ships, it will not be functional until HP ships patches soon thereafter, he said.

The addition of DCE goes along with HP's effort to open the proprietary operating system that runs the HP 3000. The venerable PA-RISC-based box is popular among manufacturing, mail order and financial institutions.

To stem user defections to Unix and other open systems, HP is beefing up MPE/IX's Unix characteristics. With MPE/IX 5.0, for instance, HP is adding Unix user and programmer interfaces [CW, May 30]. Last week, Bill Gates, director of technology at Longs Drug Stores, Inc., described 5.0 as "probably the biggest and most major release of MPE in years."

Push and pull versions

Although users have been able to purchase what HP calls "pull" versions of MPE/IX 5.0 — which have many of 5.0's features — since June, many have been awaiting the more complete "push" version that was slated for this month.

Stachnik last week said the vendor decided several months ago to delay the general release version. Problems that stalled the unveiling of the pull release also impeded the push version, he said. Those problems included cases of 5.0's crashing the HP 3000 it runs on — an almost unheard of occurrence for the workhorse 3000, he said.

Gates said last week's announcement arrived as an electronic-mail notice, but he added that the delay will not directly affect him because he already runs pull versions of 5.0.

"But we are waiting for a couple of things in the push release — some things having to do with DCE," he said. Gates, who is beta-testing DCE in MPE/IX 5.0, said it will help him manage a mix of systems in stores and warehouses better and will improve security, directory services and naming services.

JC Penney uses HP 3000 in warehouse app. Page 64.

Kmart revamps store-based systems

By Julia King

Kmart Corp.'s IS chief, David M. Carlson, last week disclosed a plan under which the financially ailing retailer will overhaul its store-based information systems.

Kmart also announced it will shut down 110 of its stores and cut its management work force by 10% during the next 18 to 24 months. The moves were designed to boost performance of the company's core discount retail operations.

Last month, the Troy, Mich.-based chain reported a drop in profits for the seventh straight quarter.

If all goes according to plan on the IS side, Carlson said a preliminary draft of what he called Kmart's "next version strategic store environment" should be ready for review by Kmart executives by month's end. Adoption of the plan is slated for December, but implementation will take several years, he said.

Something better, something new

Nine-year-old information technology currently in place at Kmart's 2,300 stores includes some 50,000 point-of-sale terminals linked to store-based IBM PC/AT controllers tied together over IBM Token Ring LANs. Stores also use handheld radio frequency devices to scan incoming inventory.

"There's no new application that is prompting the review and replacement of this system," Carlson said. "But the fact that it is as old as it is implies there's something in the architecture that could be even better."

Carlson said inventory — one of Kmart's problem areas in recent months, according to some retail analysts — is one of the functions the new in-store system will support. Analysts have blamed lean inventories for keeping sales down at Kmart stores over the past several quarters.

The company also appointed Virginia G. Rago to head the effort, naming her to the new position of vice president of store systems development. Formerly vice president of IS at Kmart's fashion division, Rago will assume the post Oct. 1.

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News Shorts

Cray plans layoffs and plant shutdown

Cray Research, Inc. said it will cut about 400 of the 1,500 jobs at its Chippewa Falls, Wis., plant by year's end. The supercomputer maker will also suspend most production work at the plant for four to eight weeks while it implements new processes designed to reduce manufacturing cycle times to 16 weeks or less. The company will continue to work on the upcoming Cray J90 entry-level system and the high-end Triton project.

IBM unwraps networking cornucopia

IBM last week announced a slew of new or enhanced products designed to integrate multiprotocol networks and move users toward Asynchronous Transfer Mode (ATM). The Nways multiprotocol router family now features native support of SNA and some LAN protocols across most routers and controllers. Also key, users can route this traffic over Token Ring, Ethernet and frame-relay links.

Navigation Server finally sails

Sybase, Inc. plans to unveil its Navigation Server multiprocessing database add-on product this week after unforeseen reworking and fine-tuning delayed Sybase and its development partner AT&T Corp. more than a year. Separately, Sybase plans to announce changes to its database support offerings, including mix-and-match service options tailored for desktop, workgroup and enterprisewide needs.

MCI tosses its hat into ATM services ring

In December, **MCI Telecommunications, Inc.** will kick off an ATM service, MCI HyperStream ATM, which will support speeds from 1.5M to 155M bit/sec. The service will be internetworked with other MCI wide-area data services, such as frame-relay and switched multimegabit data services, next year. Also next year, MCI will tailor a class of ATM services to MPEG video transmissions. The service will start with flat-rate pricing, moving to both flat-rate and usage-based pricing by early next year.

IBM to offer full pak version of OS/2

IBM last week announced it will offer a "full pak" version of Warp, the next version of OS/2, expected next month. The full pak version, like OS/2 2.1, includes full functionality for users who want to run Windows applications under OS/2. Users who install the current Warp beta without a version of Windows present cannot run Windows applications.

Cirrus Logic, IBM team up to build chips

IBM late last week entered into a venture with **Cirrus Logic, Inc.** to make semiconductor chips and jointly own IBM's East Fishkill, N.Y., production plant. The plant will continue to make memory and logic and memory chips for IBM. Separately, IBM announced plans to lay off about 7% of its U.S.-based sales and service workers. The cutbacks are part of IBM's previously announced intention to reduce its worldwide work force by some 35,000 employees.

Symantec stops shipping Mac utilities

Symantec Corp. last week suspended shipments of its month-old Norton Utilities for Macintosh 3.0 after it found a technical problem that can cause loss of data. A software fix will be included in Version 3.1, which will be shipped as a free upgrade. The update will be posted through several on-line services and will replace all Version 3.0 packages in retail stores. Symantec said the glitch does not affect its Norton Utilities products for IBM-compatible PCs or any of its other Macintosh products.

Compaq 'Smart'-ens up

Expands support to databases

By Jaikumar Vijayan

Compaq Computer Corp.'s bid to break into the information systems glass house continues. The company today will extend support of its SmartStart installation software to database applications, a move it claims will make database installations much easier for users of its server platforms.

For example, the SmartStart database extension for integration of database software will let users automatically install and tune Oracle Corp.'s Oracle 7.1 or Microsoft Corp.'s SQL Server 4.2 databases on Compaq's high-end ProLiant server platforms.

Users liked the idea but said they want SmartStart support extended to other databases, particularly Unix-based ones.

"I think it is a terrific idea under NetWare, but it would be better if they had more Unix-based support" on SmartStart, said Greg Cummings, a network administrator at the North York Board of Education in Toronto.

Other users agreed that automatic installation and configuration of databases such as Oracle and SQL was a great idea as far as it went.

"It's great for users of [NetWare Loadable Module]-based databases. Installing databases, particularly something like Oracle, is a bear," said Ken Sacca, a LAN administrator at law firm Fish and Richardson in Boston. However, as Compaq attempts to scale the enterprise with its PC servers, it will have to extend Unix support in the future, Sacca said.

Industry analysts, however, said the announcement fits in with Compaq's plans to position itself as a serious player in midrange computing.

"They are focused on the idea of moving the same ease of operations and installation seen in the PC world up into the server world," said John Daly, a senior industry analyst at Summit Strategies in Boston.

Others, like Cheryl Currid, president of Currid & Co. in Houston, said SmartStart support for databases would reduce the time needed for database installation, tuning and testing. "That puts Compaq a step ahead of other PC vendors, [but] they are not trying to be an HP or DEC or an IBM right now."

Serving something new

Meanwhile, rival AST Research, Inc. has begun to take the wraps off a range of products and software it hopes will bolster both its presence in the client/server arena and flagging revenue (see story page 32).

AST today will unwrap an Intel Corp. Pentium-based server line to replace its Premmia SE family. This marks the beginning of a move to consolidate its server brand names under the Manhattan name, a spokeswoman said.

Key features of the new high-end Manhattan servers, available in two feature sets and price points, include dual-Pentium processing capabilities; error-correcting code memory; Peripheral Component Interconnect and Extended Industry Standard Architecture (EISA) slots to make use of current EISA cards; redundant arrays of inexpensive disks subsystems; and a SCSI backplane with hot-swappable hard drives. Also included is AST's Percepta server management software, which gives users a graphical interface to server configuration and installation.

IBM spices up pricing on parallel mainframes

By Craig Stedman

IBM this week will formally introduce low-end versions of its parallel mainframes that can run older versions of MVS and other software products. But as expected, the company is also offering pricing deals aimed at enticing customers with aging systems to upgrade both their hardware and software.

Reaching out to users of its old 3080, 3090 and 4381 systems is critical for IBM, said Rob Schafer, a senior research analyst at Meta Group, Inc. in Westport, Conn. Those customers are "most vulnerable" to Unix migration or to relying on the used market for their mainframe purchases, he said.

A prime example is Sysco Food Services/Albany, a division of Sysco Corp. in Albany, N.Y., that has two 4381s. Ted Kassel, vice president of information services at the unit, said his approach has been to "ride the life cycle curve" and buy used mainframes to save money. IBM has "been losing me to the third-party vendors," he said.

However, the kind of savings IBM is talking about could propel him toward the parallel machines "if they get creative enough," Kassel added. "My preference would be to have brand-new, shiny stuff in here," both to reduce energy costs and to make systems management easier by consolidating to a single system, he said.

Squadron assembled

IBM's 9672 R models are available immediately, with new operating system releases to follow next year

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Already, IBM has been making sharp cuts in its pricing on the parallel System/390 hardware, dropping it toward $15,000 per MIPS [CW, Sept. 5]. In addition, two other kinds of price breaks are available with the new low-end 9672 R models, code-named Squadron.

Buyers who migrate to an MVS/ESA 5.2 release due in the middle of next year will qualify for IBM's new parallel sysplex software pricing [CW, Aug. 29], which has the potential to save up to 30% off traditional tiered licensing, said William Reedy, director of mainframe product marketing and merchandising at IBM.

IBM is also offering 9672 R packages designed to produce monthly payments lower than the maintenance and energy bills paid by users of old 3080, 3090 and 4381 machines, Reedy said. The packages include the CMOS-based hardware; the latest release of MVS, VM or VSE; a choice of 10 additional software packages; maintenance; and migration assistance.

Specific package pricing was not disclosed last week, but industry sources familiar with IBM's plans said the company has shown examples ranging from a 33% savings in three-year cost of ownership to a 5% increase over the cost of using a 3090 200E.

IBM must go after "back-level" customers, but persuading them to abandon their existing software will be a challenge, Schafer said. Going from older MVS/XA releases to the current MVS/ESA technology "is like jumping from a Volkswagen into a Ferrari," he said. "A lot of the trailing-edge folks are going to be hesitant."

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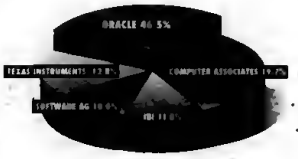

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Microsoft seeks to ease OLE development

By Melinda-Carol Ballou

Microsoft Corp. and Symantec Corp. last week announced a migration kit that targets C programmers as part of an ongoing attempt to bind application developers to Microsoft's classes and infrastructure, some developers and analysts said.

The Microsoft Foundation Class (MFC) Migration Kit is intended to facilitate the transition from 16-bit C applications to 16-bit and 32-bit development on C++, company officials said. The MFC applications will also run across multiple platforms, including Unix and Macintosh, via third-party support.

The primary features of the MFC Migration Kit include the following:

- Allows C developers greater ease in creating applications by providing easy porting to the reusable software classes available with MFC.
- Smooths the way for the creation of 32-bit applications running Microsoft's Windows NT and Windows 95, the 32-bit upgrade to Windows.
- Facilitates application support for Microsoft's Object Linking and Embedding (OLE).

Several developers who are planning to port their C code to C++ code said the MFC Migration Kit could be useful.

"It takes 16-bit code and lets you port it over to 32-bit code. It will make the porting easier by giving you the steps," said Babu Sonty, a systems specialist at Union Central Life Insurance Co. in Cincinnati.

Microsoft also wants to make OLE easier for developers at all skill levels with its upcoming series of products. These include Visual Basic 4.0, which recently shipped in an early beta release, and Visual C++ 2.0, which the company will announce this week along with the MFC Migration Kit.

The ultimate payoff for Microsoft in promulgating the use of OLE and MFC is the "lock-in on APIs" and control of applications, said Brent Williams, an analyst at International Data Corp. in Burlingame, Calif.

One of the biggest changes with Visual Basic 4.0 is full OLE support, according to beta testers who requested anonymity. That support includes the ability to create OLE automation servers and activate compound document OLE objects.

"At the moment, there's a much higher level of technical proficiency needed to create OLE applications," one beta user said. "The ability to create this sort of [OLE support] with [an easy-to-use] tool like Visual Basic is really neat. [Visual Basic] programmers want to be able to do what [C++] jocks can do. And with this new version, they'll be able to."

Yet the tool is "still quite buggy" and is not expected to be generally released until the first half of 1995, the user added.

Ready, aim...

Borland International, Inc. will fire its own salvo at Microsoft in the form of easier, framework-independent OLE development, according to Borland sources. These capabilities are expected to ship by year's end in Version 4.5 of the Borland compiler and tools.

Details, details

This week, Microsoft will release details on Version 2.0 of its Visual C++ compiler and development tools, which are expected to ship later this month.

While Version 1.5 only offered OLE container and server support for 16-bit applications, 2.0 will extend that support to 32-bit applications. "It's 32-bit OLE support made easy — you can click to create a 32-bit application," said a source at Microsoft.

Company officials had previously announced multiplatform support for Visual C++ 2.0 and support for template and exception handling.

A prerelease version of the MFC Migration Kit will ship free of charge from Symantec and Microsoft at the Symantec Developer's Conference later this month. This will serve as a short beta program for the kit, which will be generally available from both companies by the end of next month, Microsoft officials said.

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MICRO FOCUS®

Post time arrives for network wares

By Computerworld staff

This week's Networld/Interop '94 show in Atlanta will set the stage for a deluge of product introductions, including Version 4.0 of IBM's LAN Server. A plethora of LAN and Asynchronous Transfer Mode (ATM) switching vendors will also duke it out for user mind share.

IBM is expected to formally introduce LAN Server 4.0, which now sports two installation processes, a new graphical interface and support for a broader range of communications adapters, according to sources briefed by IBM.

The first installation, called Easy Installation, lets nontechnical users install the product by answering six simple questions. IBM hopes this installation makes the product more viable through retail channels that sell to smaller accounts. The second installation is Professional Installation, which permits LAN administrators to more finely tune the system for both servers and clients.

The new graphical interface, which looks very similar to OS/2's Workplace Shell, is also intended to make the product easier to install and configure for experienced and novice users.

IBM has enhanced Version 4.0 to support nearly 200 communication adapters, sources said. The company has also improved the product's support for TCP/IP.

NETWORLD+INTEROP 94

Lotus Development Corp. is expected to officially announce Notes Express, a roughly $100, pared-down version of the $495 Notes client software that is intended to whet user appetites and spread the use of Notes applications.

Notes Express is said to enable users to read and write to Notes applications, including specialized versions produced by third-party vendors. But it will not include the application development capabilities of the $495 version.

Preferred Systems, Inc. in West Haven, Conn., will demonstrate a product it codeveloped with Novell, Inc. to ease migration from NetWare 3.x to the NetWare 4.1 NetWare Directory Services.

DS Standard is said to capture NetWare 3.x binderies in a database and analyze their contents, enabling network administrators to reconfigure the bindery information without affecting the live network. A global search-and-replace feature allows administrators to drive mappings and printer configurations across multiple binderies and locations. The product is scheduled to ship in the fourth quarter and will be priced from $295 for a 10-user NetWare server license to $4,495 for a 1,000-user NetWare license.

The following vendors will be among the throngs hawking wares at the show:

- **Standard Microsystems Corp.** in Hauppauge, N.Y., is expected to pounce on the Ethernet switching bandwagon, unveiling TigerSwitch, a 24-port switch with a price of less than $400 per port.
- **LightStream Corp.** in Billerica, Mass., will unveil its second-generation ATM switch, LightStream 2020. The switch will support legacy LAN traffic and perform routing duties for campus and wide-area backbone applications.
- **Amber Wave Systems, Inc.** in Acton, Mass., will show a workgroup LAN switch with eight Ethernet ports for less than $2,000.
- **Beame & Whiteside Software Ltd.** in Raleigh, N.C., will show BW-Connect NFS for Windows NT 3.5. The software will provide the first Network File System (NFS) services for the TCP/IP protocol stack in Microsoft Corp.'s Daytona operating system. These services include drag-and-drop printing, an electronic-mail handler and terminal emulation.

Oracle lets mobile users go wirefree

By Kim S. Nash and Michael Fitzgerald

Oracle Corp. plans to reveal today a scheme to connect users of wireless devices such as wireless modems to its relational database. Oracle's three-piece product set — called Oracle in Motion — impressed several users and analysts as a step toward taking wireless mainstream.

The products, due to ship today, were built to work around some of wireless technology's limits. But obstacles remain, such as a lack of applications and Swiss cheese security, observers said.

That a heavy hitter such as Oracle wants to address a traditional information systems audience with wireless plans "will really help jump-start the wireless business," said Andrew M. Seybold, editor in chief of "The Outlook on Mobile Computing," a newsletter in Brookdale, Calif.

Further, the products put Oracle ahead of rival Sybase, Inc., which has talked about a similar mobile database strategy in the past but has yet to spell out any product plans.

Oracle a-go-go

Oracle in Motion was designed to work over wireless networks, including Motorola, Inc.'s Advanced Radio Data Information Services, RAM Mobile Data's service and the multivendor Cellular Digital Packet Data system. The kit includes the following:

- **Message Manager** sits on a mobile device and relays messages between users and software "agents." It costs $99.
- **Message Gateway**. Priced at $400 per user, it resides on Unix servers and shunts requests and data between mobile workers and Oracle databases, electronic-mail systems and on-line services.
- **Agent Event Manager**, a $100-per-user product that tracks agents that act as messengers between mobile users and corporate servers.

But all is not rosy, and Oracle knows it. For example, wireless transmission "will never be as fast as LAN," acknowledged Jay Verkler, senior director of Oracle's 1-year-old mobile systems group.

An average LAN handles 5,000K to 10,000K bit/sec., with a send time of 0.0005 sec. to 0.001 sec., Verkler said. But with a bandwidth of 2K to 9K bit/sec., wireless can need up to 10 seconds for an average transaction, he said.

The virtual office presents several pros and cons

+	−
• User does not have to be connected to a network to access key data	• Cellular and radio networks easily violated
• User gets near-real-time information from field, making mobile workers more productive	• Throughput can be slow
	• Wireless devices still costly
	• Few off-the-shelf mobile applications

To speed the process, Oracle in Motion employs "agents" to relay messages between user and server. On the server side, the agents make queries and gather and interpret results — all on a firm's LAN. Then the agents move to the user's wireless medium of choice to deliver data relay results on the client end, Verkler said.

The products sparked user interest, but some asked how easygoing mobile would be. Programming for "intelligent agents on both ends [of an application] is not a trivial task," said John Woods, a systems specialist at Chevron Information Technology Co. in San Ramon, Calif.

Still, Woods and others were upbeat, envisioning applications where wireless access to key corporate databases would come in handy. A large Texas energy company, for example, is mulling plans to use radio and cellular devices in field systems where workers negotiate with landowners about laying pipeline on their property, said Bill Pribyl, an independent Oracle consultant in Houston.

Sun's network servers make LAN connection

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. is expected to announce a new line of PC LAN network servers at this week's Networld/Interop '94 show in Atlanta. Two models of the Unix-based Netra server product line, scheduled to be announced today, are aimed at Internet connectivity and client/server systems management.

Models that provide other network services are expected next year.

Ranging in price from $6,149 to $18,299, the Netra servers are based on single-processor SPARCstation 5 and SPARCstation 20 workstations, which have up to four CPUs. The Netra units are set to ship in November, said Maneesh Dhir, a server product manager at Sun Microsystems Computer Corp.

Other Netra servers, which will host databases for LANs as well as groupware for Novell, Inc.'s NetWare LANs, will be announced in the first half of next year, Dhir said.

Packaged to be installed with minimal setup time, the Netra servers were designed with preconfigured software to counter traditional criticisms about complex Unix systems. Sun intends to sell the servers through indirect channels, such as value-added resellers, analysts said.

Sun's new PC LAN network servers

Netra 1s	70- and 85-MHz MicroSPARC II	$6,149 (70-MHz) $8,499 (85-MHz)
Netra 1zo	60-MHz SuperSPARC II	$13,199
Netra 5s	85-MHz MicroSPARC II	$10,399
Netra 5zo	60-MHz SuperSPARC	$18,299

As expected, the Netra Unix servers are part of Sun's bid for a larger chunk of the expanding PC LAN connectivity business [CW, Sept. 5]. Systems administrators can set up user IDs and configure LAN workstations while viewing the console on the Unix server or by viewing one of the attached Windows PCs.

The Netra servers could double as file and print servers for NetWare LANs, but industry analysts predicted that most PC LAN users probably will not replace installed NetWare servers.

"Nobody's going to walk into a user department and say, 'I've got a better mousetrap than NetWare,'" said Scott Winkler, research director at Gartner Group, Inc.'s platforms and operating systems group. "But vendors are going to try to prevent Novell from extending its reach beyond its traditional domain of file and print servers." That would include Microsoft Corp.'s Windows NT server and Unix server vendors like Sun, he said.

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IBM bolsters NetView database support

Management platforms gain fail-over capability

By Steve Moore

In an attempt to upstage its network management rivals, IBM last week upgraded its NetView/6000 platform to support six leading relational databases from one point of control.

IBM also renamed the product NetView for AIX.

Simultaneously, Digital Equipment Corp. unveiled a similar upgrade of its Polycenter Manager on NetView for the DEC OSF/1 operating system.

In addition to Ingres, the two NetView upgrades now support IBM's DB2, Digital's Rdb and namesake databases from Informix Corp., Oracle Corp. and Sybase, Inc. But users may still run into difficulties with the individual database management information bases (MIB). MIBs are a standard repository for management information about the database system and its applications.

"Every vendor writes their own database MIB, so if you don't get the MIB from each vendor, you've got problems," warned Dan Bricker, a network administrator at Methodist Hospital in Fort Worth, Texas. "A MIB from Sybase won't work with a MIB from Oracle."

That can translate into both time and money expenditures for customers, who must spend staff time tweaking the individual MIBs to assure compatibility.

Another new feature of both NetView for AIX and Polycenter Manager for DEC OSF/1 is the ability to allow one NetView server to take over the management of another server's domain in the event of a failure.

- Expanded RDBMS support
- Manager takeover capability
- User interface enhancements

This feature also supports a "follow-the-sun" global network management scheme, where a NetView server in one geographic area could hand off its domain to another NetView server as needed.

"We've got 33 hospitals we're looking to set up wide-area links to, and that level of redundancy [provided by the takeover capability] will be a big help once we establish multiple NetView servers," Bricker said.

Another advantage of NetView for AIX is IBM's stated intent to integrate some of the NetView products with its new LAN Server operating system, Bricker said. "So when we go to LAN Server 4.0 with TCP/IP instead of NetBIOS, that lets me look at both my RS/6000 and OS/2 LAN environments from one location instead of having to go to multiple sites," Bricker explained.

IBM will announce LAN Server 4.0 this week at Networld/Interop '94 in Atlanta.

The one to beat

Despite IBM's boast that the new features in NetView for AIX will greatly strengthen its position among enterprise network management platforms, "Hewlett-Packard is still the target, still the vendor with the most market share and mind share," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

SunSoft, Inc. will also catch up early next year with the NetLabs, Inc. technology in Encompass, its forthcoming next-generation network management platform.

Although IBM claims NetView now has a six- to nine-month technological edge, especially in terms of relational database support, McConnell observed, "It's closer to six than nine."

NetView for AIX currently runs on Unix, MVS, VMS, OS/2 and DOS operating systems. An IBM spokesman said Microsoft Corp. Windows NT support will be provided in the next year.

Ancillary applications that tie into the NetView platform are multiplying. IBM now claims that 134 applications are shipping today, including 109 from third-party vendors and 25 from Digital and IBM.

But McConnell said users should carefully evaluate the level of integration these applications actually demonstrate with NetView. The IBM spokesman acknowledged that such support will vary widely from application to application.

To qualify as being integrated with NetView, applications must be certified in accordance with the developer's standard contract with the IBM-sponsored NetView Association.

"We haven't had all 134 applications certified yet," said Art Peters, IBM's manager of vendor development.

In comparison, HP has more than 200 applications shipping today, 15 of which have passed HP's certification process, according to Gordon MacKinney, HP's OpenView Program Manager.

Novell opens up

CONTINUED FROM PAGE 1

past year or two.

"Clearly Novell wasn't doing a good job articulating who they were and where they were going," said John Bjelland, vice president of corporate information technology at Cargill, Inc. in Minneapolis. Frankenberg is doing a better job, he added.

Last week's announcement was a precursor to Networld/Interop '94 in Atlanta, where Novell is expected to further define and detail its strategy for the coming months.

Combined NetWare and Windows shops saw the Microsoft/Novell alliance as plain good news. "Who are Novell and Microsoft supposed to be serving? Me, the customer," said Robin McCubbin, manager of data center services at National Grocers Co. in Toronto. "They don't do that when they are at war with each other." National Grocers is planning a broad deployment of Windows 95 in 1996.

Conversely, information systems managers with Macintosh and Unix client installations fear Novell will abandon them, particularly when it begins to release its more advanced services.

"As a university, we certainly want Novell to support a range of clients, so the de-emphasis [of both Unix and Macintosh] concerns me," said Andy Palms, manager of campus computing at the University of Michigan in Ann Arbor.

Ready for the future

Meanwhile, Novell will concentrate on its core business, which is enhancing the UnixWare and NetWare platforms to carry users into the next era of "pervasive computing," company spokesmen said. Novell and Frankenberg define this term as the "ability of all kinds of users to connect anywhere to any resource, service or user," said Prem Uppaluru, the company's vice president of product planning.

Frankenberg's freshly minted strategy for Novell will include the following initiatives:

- An "advanced client" that will support intuitive access to network resources within the corporation on public network services such as the Internet and at other companies. Code-named Expose, the system will support Windows, Windows 95 and UnixWare and include a Mosaic-like, three-dimensional graphical client front end, Frankenberg said at the Corporate Association of Microcomputer Professionals (CAMP) user conference held last week in Chicago.
- NetWare-based products for mobile users, including a wireless NetWare client, and remote messaging "so you can connect any device to the network regardless of where you are or the time," said David Moon, Novell's vice president of product development. Novell will also provide NetWare client support for Cellular Digital Packet Data networks, Frankenberg told CAMP attendees.
- Extension of the Novell/AT&T Corp. initiative to provide NetWare-based services over public network services. Alliances with other carriers, including overseas providers, are in the offing.
- SuperNOS, which is UnixWare and NetWare running on the same modular, distributable computing platform. SuperNOS will move from a symmetrical multiprocessing implementation of NetWare and UnixWare this year to a clustered version, with a common directory, in 1995. A fully distributed, fault-tolerant version will appear in 1996, Novell said.

This last case is an example of where Novell will continue to compete with Microsoft. With the SuperNOS project, Novell will directly challenge Microsoft's Windows NT Advanced Server because the network operating system (NOS) resides on the same machine as the NT application server, said David Cearley, a vice president at Meta Group, Inc., a research firm in Westport, Conn.

However, SuperNOS may be coming late to the party, considering that many corporations are already choosing their main client/server platforms. National Grocers, for example, likes the idea of a NetWare-Unix hybrid but has already chosen IBM's AIX as its application server, McCubbin said.

Senior editor Ellis Booker contributed to this article.

What's out, what's in

Bob Frankenberg is pruning some of the products and technologies that his predecessor, Raymond Noorda, acquired during the last couple of years.

What's out:

- Client operating systems such as DOS 7 and UnixWare for the desktop get support but no further development.
- AppWare Foundation.
- Wrangles with Microsoft.
- Processor Independent NetWare for RISC platforms.

What's still in:

- Porting NetWare and UnixWare to symmetrical multiprocessing, PowerPC and any platform that has an installed base of at least 1 million.
- UnixWare and NetWare and possibly additional platforms running an integrated set of messaging, directory, naming, security, print and file services.
- Tying WordPerfect applications into the NetWare infrastructure.
- Visual AppBuilder, a fifth-generation application development environment.
- Network Extended Services Technology, which entails extending NetWare access to the home, factory and office.
- Network Distributed Management Services, enhanced to manage networked applications as well as devices, clients and servers.

—Elisabeth Horwitt

CA slashes Ingres prices

By Thomas Hoffman

Computer Associates International, Inc. last week slashed list prices on its Ingres relational database and application development product suites by 50% and more. The bold move was to obliterate what observers called the marketing blunders of The ASK Group, Inc., which previously owned Ingres.

The price cuts are intended to help CA regain market share in the rough-and-tumble relational database management sector from incumbent leaders Oracle Corp. and Sybase, Inc. They are also expected to be a boon to Ingres and other database customers, analysts said.

Ingres customers will be able to rework their CPU-based licensing schemes in exchange for more affordable per-user and concurrent-user pricing models (see chart). In addition, Oracle and other relational database management system users will likely use CA's discounting to wrest better deals from their vendors.

"I think it's a very astute move by CA because it creates [software] bundles that are highly attractive to the Ingres installed base," said Peter Kastner, an analyst at Aberdeen Group in Boston.

Bargaining chip

CA OpenIngres Success Pack

OpenIngres (Ingres database and corresponding development tools)
Server Net
Asynch API
Precompiler for embedded SQL
Q&R tools
OpenRoad (Windows 4GL, Architect, Ingres database driver)

	New Success price*		Old price*
Total	$33,920	Total	$79,500
Per user	$2,120	Per user	$4,969

Reduction 57%

CA's price cuts "will put some pressure on those arrogant Oracle and Sybase guys to adjust their pricing," said Charles Hays, associate director of information services at Willis-Corroon, Inc., an insurance intermediary in Nashville. Willis-Corroon uses the Ingres RDBMS in 200 locations nationwide.

Makeup time

By offering free maintenance in the first year of each new Ingres license, CA's actions should counter the high maintenance fees ASK had been charging, users said. Three years ago, ASK "was going to charge us $3,000 [per year] in support when the [annual] licenses cost us less than $3,000 for two users," noted Dana Bourgeois, a systems administrator at Westinghouse Electric Corp.'s Marine division in Sunnyvale, Calif. His company uses the Ingres AD-Forms PC development tools.

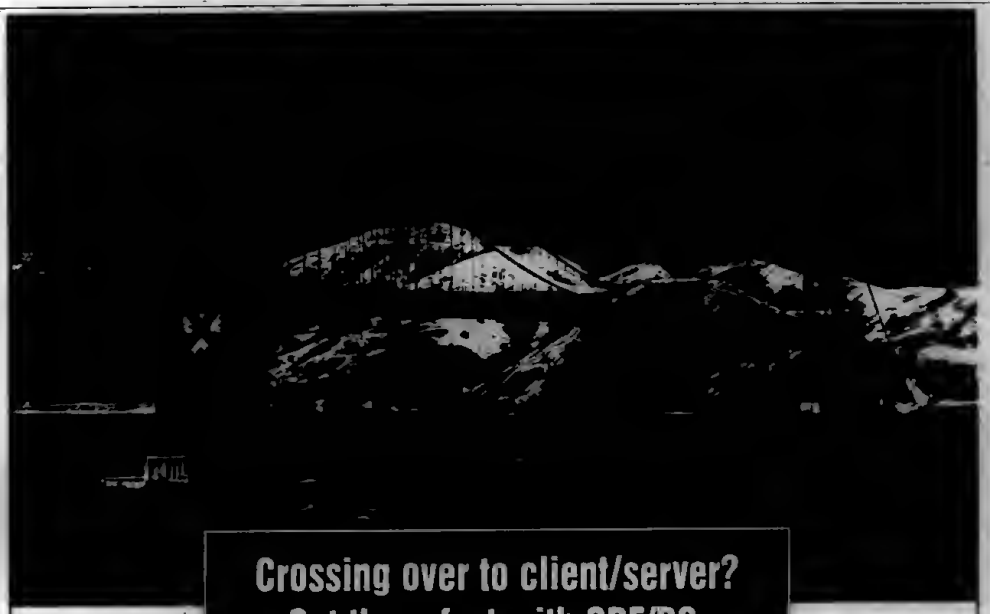
CA's price cuts squarely target industry leader Oracle. Despite having simplified its pricing structure in June [CW, June 27], the Redwood Shores, Calif., vendor's database and application runtime prices are still 50% to 75% more than the new Ingres prices, according to Karen Cone, an analyst at Gartner Group, Inc.'s software asset management service in Stamford, Conn.

For example, under CA's new OpenIngres Success Pack — a suite of database and development tool products — runtime modules for each concurrent user are priced at $500 each. The concurrent user price for Oracle's database alone is $1,600.

"Named" users of Oracle's RDBMS are charged half the price that concurrent users must pay. And while Oracle, like Sybase, does not publish its pricing, the database giant is widely known for steep discounting on its list prices, Cone noted.

Sybase and Oracle officials could not be reached last week for comment about possible price shifts of their own.

Senior West Coast correspondent Kim S. Nash contributed to this story.



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Microsoft set to roll out Daytona

By Stuart J. Johnston

Microsoft Corp. plans to finally roll out the Daytona release of Windows NT next week at Windows World in Dallas, and according to sources close to the company, it will also announce a suite bundle for its NT server applications.

While Microsoft officials declined to comment specifically on the pending announcements, Daytona — which will be called Windows NT 3.5 — is promised for third-quarter delivery and is currently in the late beta stage.

"Things look pretty good right now" to ship Daytona on time, said Rich Tong, general manager of corporate and network systems. "We've always said we wanted to sell an integrated suite of server products," he added.

Rival Novell, Inc. has also announced a suite of server applications.

Daytona is expected to be available within 30 days of the rollout. Microsoft will also ship its long-awaited Systems Management Server, code-named Hermes, as well as an update to its SNA Server within a month of Daytona, sources said.

The bundle arrangement will let users purchase all of Microsoft's NT server applications in a single package for a discounted price, the sources said. Currently, Microsoft has available versions of the SQL Server database management system and SNA Server package for connectivity to IBM mainframes. Also in the works, but late, is the Exchange messaging server, which the company now says will be out in the first half of next year.

In the meantime, the bundle will include the current Microsoft Mail server, the sources added. The sources were not able to give an availability date for the server suite except to say that Microsoft will not wait for the Exchange server before it ships the suite.

One thing that is apparently not quite ready yet is the pricing scheme. Although it is likely that the company will offer per-seat prices for the bundle, Microsoft executives want to ensure that the pricing strategy does not penalize small and medium-size business users in order to cater to corporate buyers, sources said.

Fate unknown

Microsoft's Office suite has been tremendously successful, but server products are a different animal altogether, said consultant Frank Dzubeck, president of Communications Network Architects, Inc. in Washington.

"The desktop buyer has much more of a proclivity to buy a suite than a network buyer," Dzubeck said. A server suite is unlikely to be as big a hit because server applications are much less homogeneous from user to user than are desktop applications.

"I don't think anybody is going to be successful with a server suite concept," he predicted.

What's in a name?

Formal moniker of Microsoft's next Windows release to be Windows 95

By Stuart J. Johnston

Do not call it Windows 4.0, and forget about calling it Chicago. Instead, call it Windows 95, the formal name unveiled last week by Microsoft Corp. for the next major release of its graphical desktop operating system, due out in the first half of 1995.

"We wanted a naming scheme that was a lot easier to understand," said Rich Freedman, product manager for Windows 95. "Most people don't know what version of Windows they have or what the current version is."

Windows 95 Chicago

Not everyone agrees the new name is a good idea. "If it shipped in September of this year, it would have been a great name," said Jesse Berst, editorial director of "Windows Watcher," an industry newsletter in Redmond, Wash.

Also last week, Microsoft announced its new Windows-compatible logo program, which will let third-party vendors of hardware and software that meet new testing requirements feature the Windows 95 logo on their products.

To date, the company has had separate compatibility programs for PCs, peripherals and software.

In order to display the Windows 95 logo, software packages must be 32-bit, support significant parts of the Object Linking and Embedding 2.0 specification and also run under Windows NT. Hardware will need to support the Plug and Play BIOS specification.

Delays plague OS/2

CONTINUED FROM PAGE 1

of WorkGroup Technologies, Inc. in Hampton, N.H. "But if [IBM] can get a beta out that lets developers start writing apps on the hardware, they might be all right."

The OS/2 delays are largely attributed to the following two technical problems, according to developers briefed by IBM who wished to remain anonymous:

- IBM decided too late to support multiple executables in the shrink-wrapped version of the program. This ability gives users the flexibility to install OS/2 for PowerPC on either PowerPC or Intel Corp. hardware. It also makes life easier for application developers by not forcing them to ship separate versions of their software for Intel and RISC platforms.
- IBM has continuing problems achieving smooth compatibility with 16-bit OS/2 applications. With many such applications already deployed in many all-IBM shops, the company must follow through on its promise to those accounts to continue that support.

Lost hopes

These delays appear to quash IBM's hopes of delivering at least a solid beta of OS/2 for PowerPC in close proximity to the delivery of its PowerPC-based hardware, which is slated to ship next month [CW, Aug. 1].

But John Handy, a senior engineer at a large chemical company in Gaithersburg, Md., said the delay "makes sense" for the product's long-term chances because they are typical requirements for most end users.

Users are split on the impact of this latest delay. "I don't think that kind of delay makes a big difference on a new platform where there are no applications. NT won't have all that many native applications over six or eight months," said Bob Holmes, a technical consultant at Southern California Gas Co. in Los Angeles.

To wait or not to wait

Other users who said they need the raw processing power promised by the hardware systems are not so patient.

"If IBM can't better sync up their hardware and software, I have to believe that a lot of shops, particularly Windows shops, won't hesitate to take a hard look at Windows NT," Handy said. His shop, like many other Windows sites, might consider OS/2 for PowerPC if it thinks it could gain performance advantages over Windows NT on PowerPC. But if the IBM hardware ships with only NT and AIX, users may be less likely to consider OS/2.

IBM insiders say a hot debate among top company executives has tilted one way and then the other most of this year about when to release OS/2 for PowerPC relative to PowerPC-based hardware.

The company has been struggling for months with a classic catch-22 situation: Should it ship its PowerPC hardware with a rival operating system on it, or should it risk losing hardware sales while it awaits OS/2?

Richard Guarino, a general manager of Power Personal Systems at IBM, acknowledged the debate after a presentation at the Corporate Association of Microcomputer Professionals in Rosemont, Ill.

"We need native applications to give people a reason to purchase the systems, but the question is, are there enough applications? We review this every week," Guarino said. He said that even if IBM has commitments from key software players for applications, it may not announce systems until the software is shippable.

Senior editor Ellis Booker contributed to this story.

Patience is a virtue

THIS IS THE SECOND TIME IBM HAS ACKNOWLEDGED A DELAY IN OS/2 FOR POWERPC. THE FIRST OCCURRED EARLY THIS YEAR IN ORDER TO ADD TALIGENT, INC.'S VIRTUAL DEVICE DRIVER MODEL. THE DELAY COST THE COMPANY ABOUT SIX MONTHS.

OPERATING SYSTEMS FOR IBM'S DESKTOP POWERPC LINE AND THEIR EXPECTED AVAILABILITY

Vendor	Operating system	Status
IBM	AIX 4.1	Now shipping
IBM	OS/2 for PowerPC	June 1995
Microsoft Corp.	Windows NT for PowerPC	November 1994
Sun Microsystems, Inc.	Solaris 2.x	Mid 1995

Early users of OS/2's next version speak out. See page 39.

Bundle up

Stepping up efforts to give OS/2 a better shot at the uninitiated, the IBM PC Co. is expected to bundle OS/2 and DOS/Windows on most of the desktop systems it ships by early next year.

The operating systems will have either a dual-boot capability or boot manager to allow users to flip back and forth easily between the two, sources briefed by the company said.

"I strongly suspect that by first quarter next year, you'll have a lot of trouble buying an IBM-logo-ed PC that doesn't have OS/2 on it," said one corporate user who was briefed.

If users ordering systems primarily for DOS and Windows do not want OS/2 on their systems, clicking on an uninstall icon will remove the IBM operating system from the PC.

"This is a good move for raising up [OS/2's] visibility among the nonreligious. IBM is doing it now because it is a lot easier to do with Warp [the 4M-byte version of OS/2] than previous versions," said Frank Dzubeck, president of Network Communications Architects, Inc. — *Ed Scannell*

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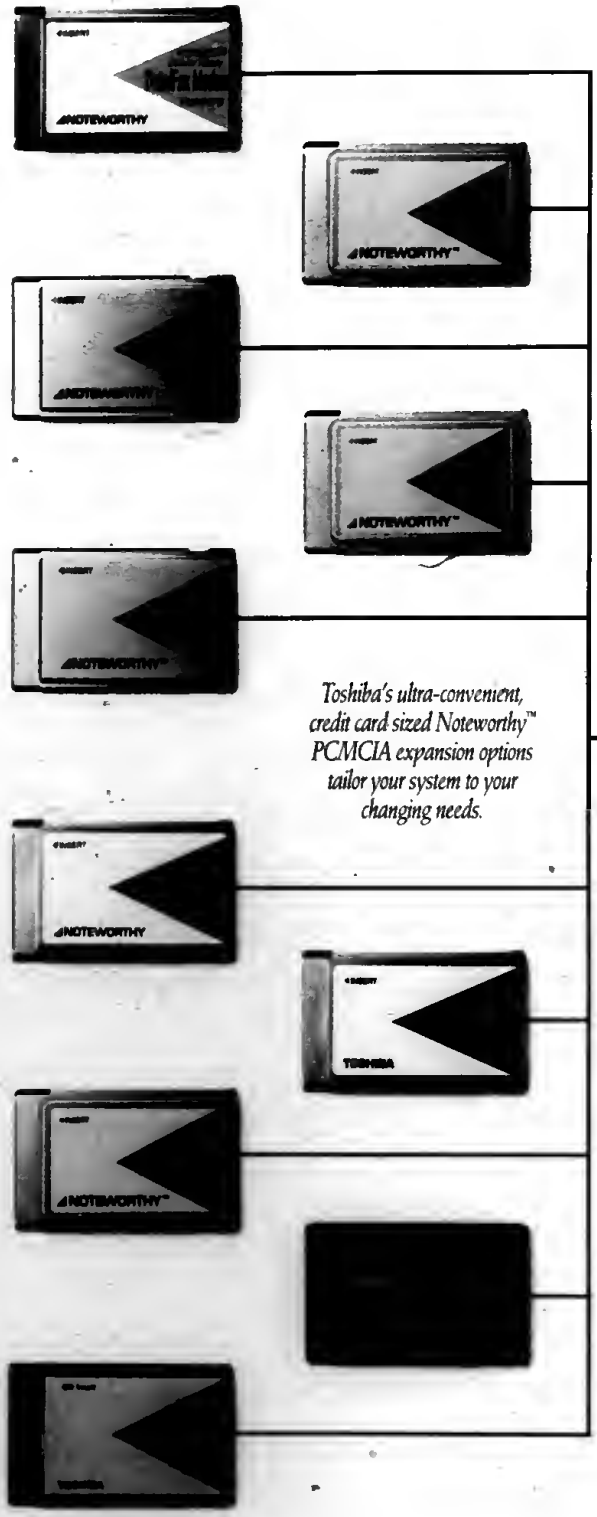

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StorageTek to unveil mixed-host disk array

By Craig Stedman

Storage Technology Corp. plans this week to take its Nordique 9100 disk array out of the suspended animation of extended beta testing — but in an altered state. Originally aimed at the mainframe market, Nordique will be the first array to support a mixture of mainframes and client/server systems.

Rather than simply a low-end counterpart to StorageTek's Iceberg 9200 mainframe array, Nordique has evolved into a mixed-host device that can connect to multiple systems simultaneously, the company said. Other mainframe storage vendors are working on similar products [CW, May 16], but Nordique will be the first available.

StorageTek, which is introducing Nordique at a user meeting in Denver, said mainframe and Unix hosts cannot access the same data. Instead, users implementing the Shared Storage Resource feature can manually allocate portions of the subsystem to host computers.

Bipolar	
Redundancy supported	RAID Levels 0, 1, 5
IBM disk emulation	• 3380K • 3390 Model 2 • 3390 Model 9 (planned by year's end)
Controller	Modified StorageTek 8380 with SCSI interface
List	$91,000 for 15G bytes

While that is a lesser step than full data sharing, analysts said it could save buyers money by reducing the number of storage devices needed. Shops currently moving from mainframes to client/server setups would also be able to hang onto their storage equipment as they migrate.

The mixed-host capability signals "a neat evolution" in storage, said Bill Finefield, administrator at the Defense Information Systems Agency's data center in Richmond, Va. Even without data sharing, users should be able to streamline the process of moving files among systems because the need to upload and download data into different devices would be reduced, he added.

What's the holdup?

David Weiss, StorageTek's executive vice president of systems development, said Nordique's beta testing was extended by three months due to performance problems in writing data to the disks. The company said performance has been improved, but the array is still best-suited for read-oriented applications.

David Vellante, a senior vice president and storage analyst at International Data Corp. in Framingham, Mass., said the positioning of Nordique as a mixed-host array makes sense given the performance pitfalls that can be encountered with redundant arrays of inexpensive disks (RAID) Level 5 technology.

Besides mainframes, Nordique will support Unix machines from IBM and Sun Microsystems, Inc. in addition to servers running Microsoft Corp.'s Windows NT, The Santa Cruz Operation's SCO Unix and Novell, Inc.'s NetWare, StorageTek officials said. Its capacity is 120G bytes now and will increase to 272G bytes by year's end, they said.

Along with the product, StorageTek said it will announce an initial sale to Motorists Insurance Co. in Columbus, Ohio. The company added that Nordique, which combines Data General Corp.'s Clariion disk subsystem with a StorageTek controller, should be generally available "within a few weeks."

List pricing for Nordique is just over $6 per megabyte, but Vellante said he expects it to sell for half that amount. By comparison, StorageTek is getting about $5 per megabyte for Iceberg, which has more functionality and is being expanded to support 400G-byte configurations.

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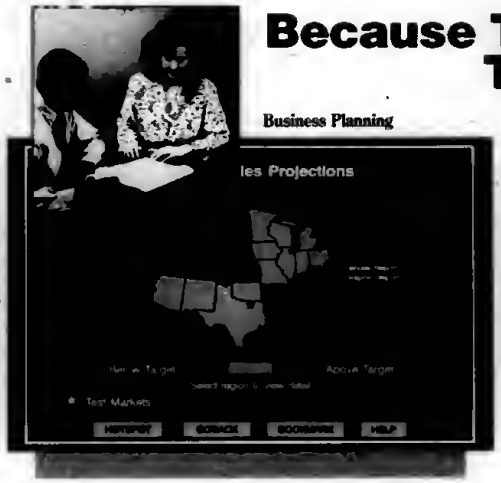

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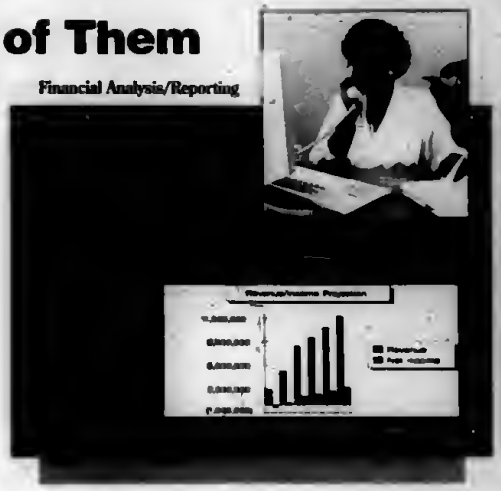

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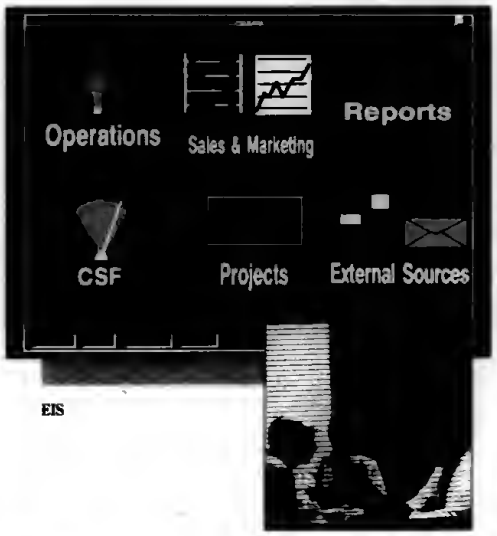

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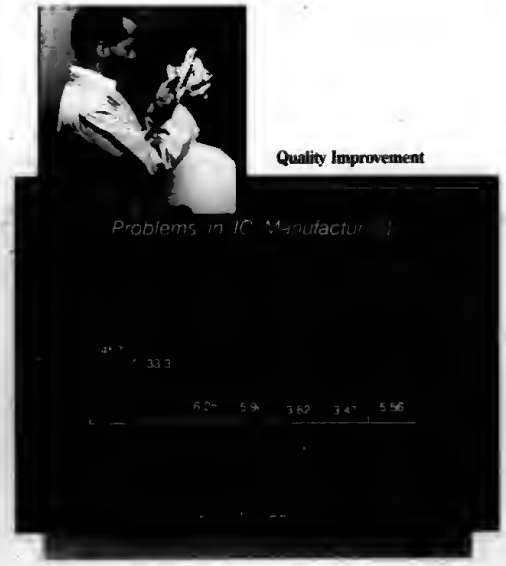

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Pricing 'wars' are spilling no blood

Customers not waiting for more price drops

By Michael Fitzgerald

If all your favorite PC makers start slashing prices right and left, is it a price war?

The consensus seems to be: not really.

"This is more of a pricing party," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. The vendors that are cutting prices "all knew everybody else was going to show up" with price cuts, he said.

Officials at several vendors attributed the recent round of cuts to price cuts by Intel Corp. and assorted hard drive makers on their products. "We all knew [their price cuts] were coming, and we've planned for them," said Dan Sheppard, director of desktop PC marketing at AST Research, Inc.

Doug Kass, an analyst at The Viewpoint Group in Santa Cruz, Calif., said, "The key elements in a price war are either a disparity between what vendors are charging and what users are willing to pay, or somebody sets a bottom-water mark more than 15% below what anybody else is charging. Neither of those are present in this case."

Zwetchkenbaum said the recent spate of vendors striking down prices as though it were their new favorite pastime is a function of faster product cycles. Vendors must cut prices to clear the way for new products on a more regular basis. Compaq Computer Corp., IBM PC Co., Dell Computer Corp. and AST are among the many that have cut prices on desktops — in some cases several times in the last few months.

> "This is more of a pricing party."
> — Richard Zwetchkenbaum, IDC

Users said the repeated price cuts are not giving them pause in buying, generally speaking.

"I don't think it affects anybody's buying pattern — the real key is meeting the business need," said David Pinkard, a technical consultant at Mallinckrodt Medical, Inc. in St. Louis. "If you have a need [for product], you're going to fill it. You know you'll get better prices down the line, but your business needs don't go away."

Pinkard added that the best thing users can do is try to "indemnify yourself to radical shifts in technology" by buying upgradable PCs.

Rethinking but not delaying

"Price cuts are positive because we can get things cheaper. But we don't delay purchases," said an information systems manager at a large Midwestern pharmaceutical company who requested anonymity. However, he said price cuts caused the firm "to rethink" the price/feature trade-off. "We have a price point in mind that we try to budget to, and as the price of the base unit comes down, we might look at adding other options such as more memory."

Indeed, some vendors say talk of price cuts masks the market reality that overall, desktop prices are rising.

Sheppard said, "My computer prices are actually going up because we're putting more things in them." He acknowledged, however, that prices are dropping on selected base models.

But a price war may yet develop. Hewlett-Packard Co. plans to establish itself as the industry price leader later this month, according to sources close to the company. The sources were not specific on pricing but said HP will undercut other PC makers by an amount that will make them take notice.

"We have to cut prices," said Boris Elisman, product marketing and programs manager at HP in Santa Clara, Calif. He declined to be specific.

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Handheld auditing eludes Chicago commodity traders

By Ellis Booker

After $12 million and five years of trying, two major Chicago trading organizations still have not implemented a wireless handheld device to improve audit activity in the exchange pits.

The Automated Data Input Terminal (Audit) project was spurred by a 1989 investigation by the Federal Bureau of Investigation into illegal trading practices at the Chicago Board of Trade (CBOT) and the Chicago Mercantile Exchange (Merc). Both exchanges still use a pen and paper cards as their first step in recording a trade, and exchange executives said technical difficulties are to blame for the automation's delay.

In fact, the two Chicago exchanges have petitioned the Commodity Futures Trading Commission in Washington for a four-year extension beyond the October 1995 deadline to meet the rules put forth in the 1992 Future Trading Practices Act.

What's the holdup?

When deployed, Audit would record — electronically and virtually instantaneously — every trade in sequence. This would prevent the abuses cited by the 1989 FBI investigation, such as dual trading and front-running, whereby traders fill personal orders either simultaneously or ahead of their customers.

"Last May we picked a prototype . . . and the prototype was accepted," said John Geldermann, former chairman of the Merc and co-chair of the joint Audit committee of the two exchanges. The exchanges then changed the prototype "to make it more user-friendly and faster," he said.

Those changes have delayed Audit's implementation, which, according to 1991 printed accounts, was expected by the end of 1992. Exchange spokesmen, while verifying the $12 million figure, said the 1992 date referred only to testing, which did occur then.

Technical issues still plague the system, the spokesmen said. "We are receiving releases of the software, sometimes two per month, that have to be tested and debugged," Geldermann said.

The prototype is being developed in a joint venture between Synerdyne Corp. in Santa Monica, Calif., and Sieko, which is supplying the hardware platform. Synerdyne officials have referred all questions to the exchanges.

But outside observers suggested that cultural and political pressures may be keeping the systems off-line.

Floor traders *in Chicago still await handheld trading devices*

"I believe that at this point in time, the technology is viable for these sorts of financial applications," said Karen Scherberger, research director in the applications solutions center at Gartner Group, Inc. in Stamford, Conn. "More likely, the reasons [for the delay] have nothing to do with technology."

Jay Peake, an analyst specializing in financial markets and technology and a Monfort Professor of Finance at the University of Northern Colorado in Greeley, Colo., agreed.

"In trading, the old way to get orders together was in a large room," Peake said. But that method could easily be obviated by existing technology, except for the fact that "by keeping the information in the pit, the [pit trader] has an advantage, a leg up."

Frustrating wait

Geldermann, however, defended the work of both exchanges, arguing that refining the prototype has been "a much larger task than we had ever anticipated."

"How long did it take airlines to find a new system?" Geldermann asked. "This is very technical. . . . There are 19 tasks that were outside [the] original prototype."

Meanwhile, the commission in Washington has yet to rule on the extension request by the exchanges. A spokesman expressed some frustration last week with the delay at meeting what he called the commission's "minimum requirements."

The commission is scheduled to present a status report next month on the progress of the futures exchanges and their compliance with the 1992 act.

Applets an unlikely option for users

By William Brandel

Users have heard much talk from vendors recently about how easily object-based technologies will allow them to break their desktop applications into applets, or individual components.

But don't count on being able to buy them that way.

Some customers would like the option of buying components, or the specific pieces of applications that their users actually use.

"I would like the choice of functions," said Jeffrey Tompkins, manager of marketing research and data systems at Pepperidge Farm, Inc. in Norwalk, Conn. Pepperidge Farm has standardized on Microsoft Corp.'s Office suite. "If MIS were able to take these different functions and tie them together, that would be great. Not everyone wants the same thing."

But while users may want applets, vendors will not provide them for several reasons. Suppliers risk losing account control and a steady upgrade revenue stream. Both vendors and users acknowledge that to buy the software they have today as components could drive up software costs. However, users probably would not buy as much software.

Microsoft and Lotus Development Corp. — both of which advocate object technologies — are now downplaying user demands for applets. While both recently said it is technically feasible to break applications into components, they said they do not intend to sell their applications that way.

Lotus officials, for example, gave a mixed response to questions about their component plans. While not altogether ruling it out, Kathryn Roy, a marketing manager, said, "It's like buying a car. Nobody wants to go out and buy it in parts. They want the whole thing."

Bits and pieces

Where the major software vendors stand on componentized software:

Microsoft
Position: Will not break apart desktop applications or suites into applets.
Reason: Will further complicate licensing structures for users.

Lotus
Position: Leaning against it; has not ruled it out.
Reason: Software sold in suites is already inexpensive.

WordPerfect
Position: Will sell software as components.
Reason: Will give users the flexibility to build customized applications.

Forging ahead, however, is WordPerfect, which said it will deliver an unspecified OpenDoc-based application component within one year.

Some vendors see suites as the answer to the choice issue. The mass volume market thinking has driven sales of software suites at user sites that have needed to upgrade many applications — or move to a new platform such as Windows. However, users say suites are not the panacea for integrating a mishmash of DOS and Windows-based desktop applications.

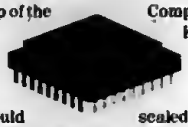
For example, ATI Technologies, Inc., a video hardware manufacturer in Toronto, recently had to give its Office users an extra copy of Microsoft's Word because the Office version did not have the same templates as the stand-alone version did, according to Sharon Burdette, a business systems analyst at the company.

"That is redundant and is a waste," Burdette said. "It would have been nice to just upgrade them with a templates applet. It would give us a lot more flexibility in upgrading software and giving our end users their individual functions and features."

Digital boosts Alpha with 300-MHz chip

By Craig Stedman

Digital Equipment Corp. last week introduced a high-speed Alpha AXP microprocessor that further secures its place at the top of the performance charts. The 21164 chip runs at up to 300 MHz and should begin appearing in systems within nine to 12 months, the company said.



Analysts were impressed by Digital's claims that the 21164 will perform two to three times faster than 100-MHz Intel Corp. Pentium and PowerPC chips. Yet they noted that Digital is still having trouble translating its speed advantage into sales beyond its installed base.

Could be worse

Digital's lead in microprocessor performance "is unqualified," but Alpha "still suffers from being a Digital-only product despite their best efforts," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

And the situation may actually be getting worse. The three best-known system vendors backing Alpha, other than Digital itself — Ing. C. Olivetti & Co., Encore Computer Corp. and Kubota Pacific Computer, Inc. — have all dropped or scaled back their plans for the technology, Christiansen said.

"Being the fastest is not necessarily a leading indicator of success," the analyst said. The 21164 should provide a good performance boost for Digital's systems once it becomes available, but it will not likely be a high-volume chip for use at the client level "for quite a while," he added.

Scheduled for volume availability next March, the 21164 will break through the 1 billion instructions per second barrier, according to Digital. The device, code-named EV-5 and capable of issuing four instructions per CPU cycle (CW, Sept. 5), will also be sold in a less-expensive 266-MHz version.

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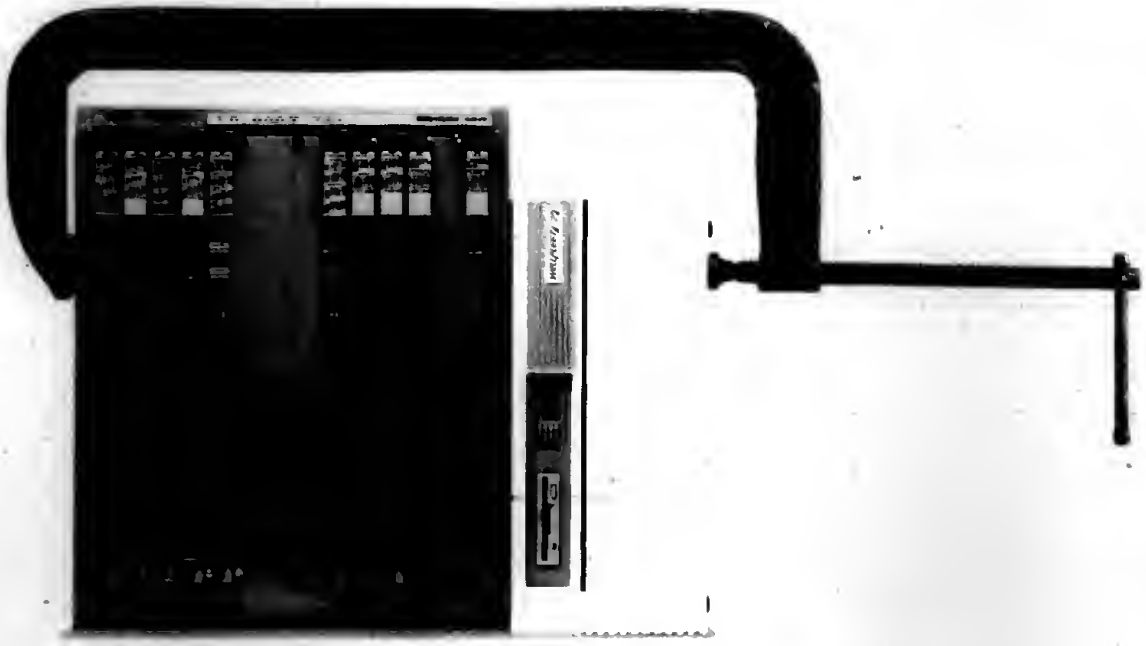

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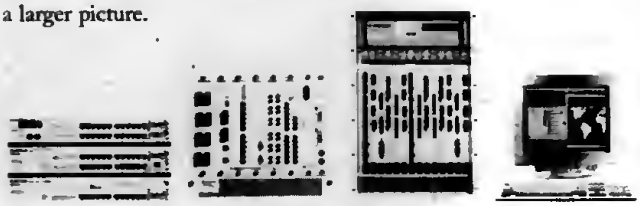

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EMERGING TECHNOLOGIES

Briefs

IBM exec resigns

Hans-Olaf Henkel, president of IBM's European operations, last week resigned after less than a year on the job. The action comes as IBM reorganizes its sales force into worldwide vertical market groups designed to reduce the power of its geographic units. IBM said Henkel left amicably and will remain a member of IBM Europe's board of directors.

Interleaf restructures

Interleaf in Waltham, Mass., last week formed five new business groups and completed a 12% work force reduction as part of a restructuring plan. A $7 million restructuring charge will be applied to cover the cost of this as well as consolidating the sales offices.

Cable creates forum

Cable Television Laboratories, Inc. in Louisville, Colo., the cable industry's research and development consortium, has formed the Cable/IT Convergence Forum as a way to exchange information between the cable and computer networking industries.

SHORT TAKES America Online, Inc. in Vienna, Va., said it has split into four operating divisions to capitalize on emerging market opportunities in the interactive services market. . . . Multimedia product developer Media Vision has entered into a loan agreement for $10 million in revolving credit as part of the Fremont, Calif., company's plan to emerge from Chapter 11. . . . Shaul Shani has been appointed co-chairman at application development tool maker Sapienas International Corp. . . . Object database developer Objectivity, Inc. in Mountain View, Calif., has secured $2 million in equity financing. . . . Health care systems provider National Data Corp. has signed a letter of intent to acquire General Computer Corp. in Twinsburg, Ohio.

AST warns of first-quarter loss

Price wars, glitches trip up firm, hammer stock

By Jaikumar Vijayan

Throughout the summer, desktop vendors have stoically maintained that there is no price war going on while incessantly trading price cuts with one another. Last week, however, at least two vendors acknowledged that market price pressures are having an impact.

In the case of AST Research, Inc., it is definitely causing some pain. Citing desktop price wars, production glitches and component constraints, AST warned investors last week that it is heading for an unspecified first-quarter loss for the period ending Oct. 2. The company would say only that it expects revenue to be flat with last year's figure of $514 million. This is significantly less than its fourth-quarter revenue of $584.5 million.

Moreover, the company also said it expects to just break even during the quarter ending Jan. 1, 1995.

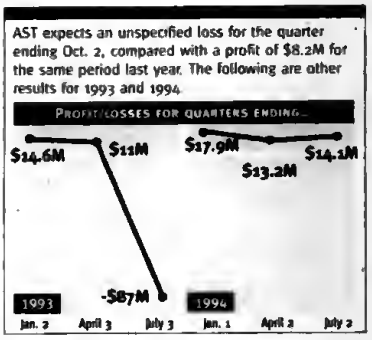
Declining margins

Houston-based Compaq Computer Corp., meanwhile, said it will probably see its margins drop through the remainder of the year. Market leader Compaq has led the recent price cut charge. Alluding to its pricing actions, a Compaq spokesman said second-quarter gross margins of 26.6% were probably not sustainable as the company continues to build market share.

The spokesman said the company is in full control of margins and projected lower margins only because Compaq is increasing market share through pricing.

AST's revised first-quarter estimates are below market expectations and are expected to depress the company's stock considerably, analysts said. In particular, analysts said they were surprised by the company's apparent production problems.

"AST is not a company that historically has screwed up with production and engineering," said David Wu, an analyst at Wall Street broker S. G. Warburg Research.



According to Wu, the company, which recently appointed former Senior Vice President Jim Schraith as president (replacing founder Safi Quereshey), may have lost some of its product and market focus following the acquisition of Tandy Corp.'s PC operations in the fourth quarter of last year. AST is building PCs for more than 6,500 Tandy/Radio Shack stores as part of a three-year supply agreement.

"The company may have bitten off more than it could chew," Wu suggested. "Now they've got to keep their energies focused on what they do best — engineering and manufacturing."

Pain in the pocket

Observers agreed that AST's recent sluggishness in announcing several planned product introductions as well as annoying product glitches in its Premmia, Bravo and Ascentia lines, particularly during a period of intense price competition, could have seriously hurt its performance during the current quarter.

"The average product life cycle these days is between six and nine months. If you have products that are delayed by more than two months, that's almost a quarter its entire life span," observed James Greene, an analyst at BIS Strategic Decisions in Norwell, Mass.

More importantly, Greene said, "the first two months are when you make most of the money on a new product. After that, it is the price reduction phase."

Greene suggested that as a result of this, AST would have had to price its product introductions more aggressively than was originally planned, causing significant price pressures.

AST itself would not comment further on the issue, though analysts said they expect some top level management additions and replacements could come soon. The company is also in the midst of server enhancements and introductions that it hopes will bolster its presence in the server market, according to a spokeswoman.

KnowledgeWare fends off lawsuits

By Melinda-Carol Ballou

KnowledgeWare, Inc. resolved a 1991 shareholder lawsuit earlier this year, only to become the target of further lawsuits last month. Five shareholder lawsuits were filed in August, according to the clerk's office at the U.S. District Court in Atlanta and internal company sources.

At issue is KnowledgeWare's restatement of its results released earlier this month for fiscal 1994. Company officials refused to comment last week on the lawsuits.

While KnowledgeWare appeared to have a string of profitable quarters this year — after severe losses last year — the amended results paint a different picture.

The merger agreement with Sterling Software, Inc., a Dallas-based software company, was also amended (CW, Sept. 5). The deal is expected to close by Nov. 15, after which the combined company will function as Sterling Software.

A key issue for Sterling's success, analysts said, will be its ability to move forward with KnowledgeWare's eclectic and far-ranging product set.

"Sterling's financial controls will alleviate the [financial] situation but won't alleviate the fundamental issues about whether they can sell the product or not," said Charles Phillips, senior vice president at Kidder, Peabody & Co., a New York-based investment company.

A spokeswoman said the discrepancy in financial results came from the company's reseller program and necessary accounting practices that were not in place. "Receivables started to grow" when resellers did not pay their accounts, she said. Sources said that the problem was particularly acute among the company's federal government integrators.

Income slip

KnowledgeWare's net income decreased in its first quarter this year, from $1.6 million as originally reported to $1.3 million in the amended results; in the second quarter, from $2 million to $278,000; and in the third quarter, from a gain of $807,000 to a loss of $5.3 million.

The original agreement between Sterling and KnowledgeWare, announced Aug. 1, was revised early this month. That change cut the deal from about $8 per share to about $5 per share.

Roughly 2.4 million shares of Sterling stock will be issued to KnowledgeWare in connection with the merger, 20% of which will be held in escrow. Those escrow funds could be used to address any types of securities claims or filings, company officials said.

Sterling also purchased $15 million of secured indebtedness of KnowledgeWare from IBM Credit Corp. and agreed to loan KnowledgeWare up to an additional $7 million, officials announced earlier this month.

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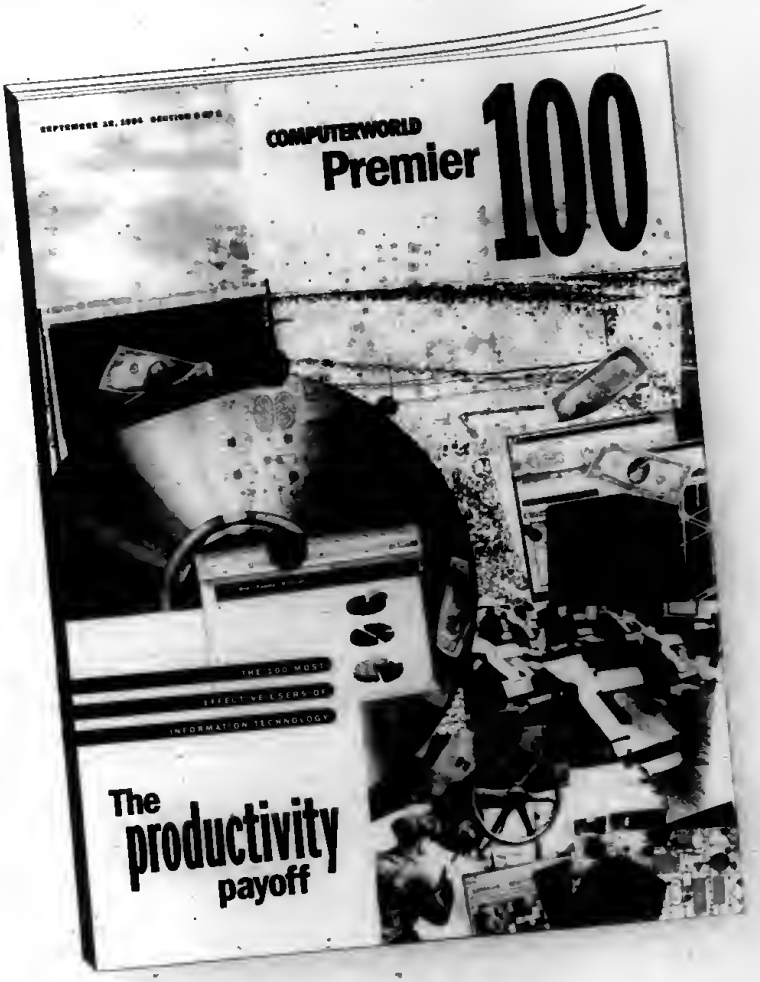

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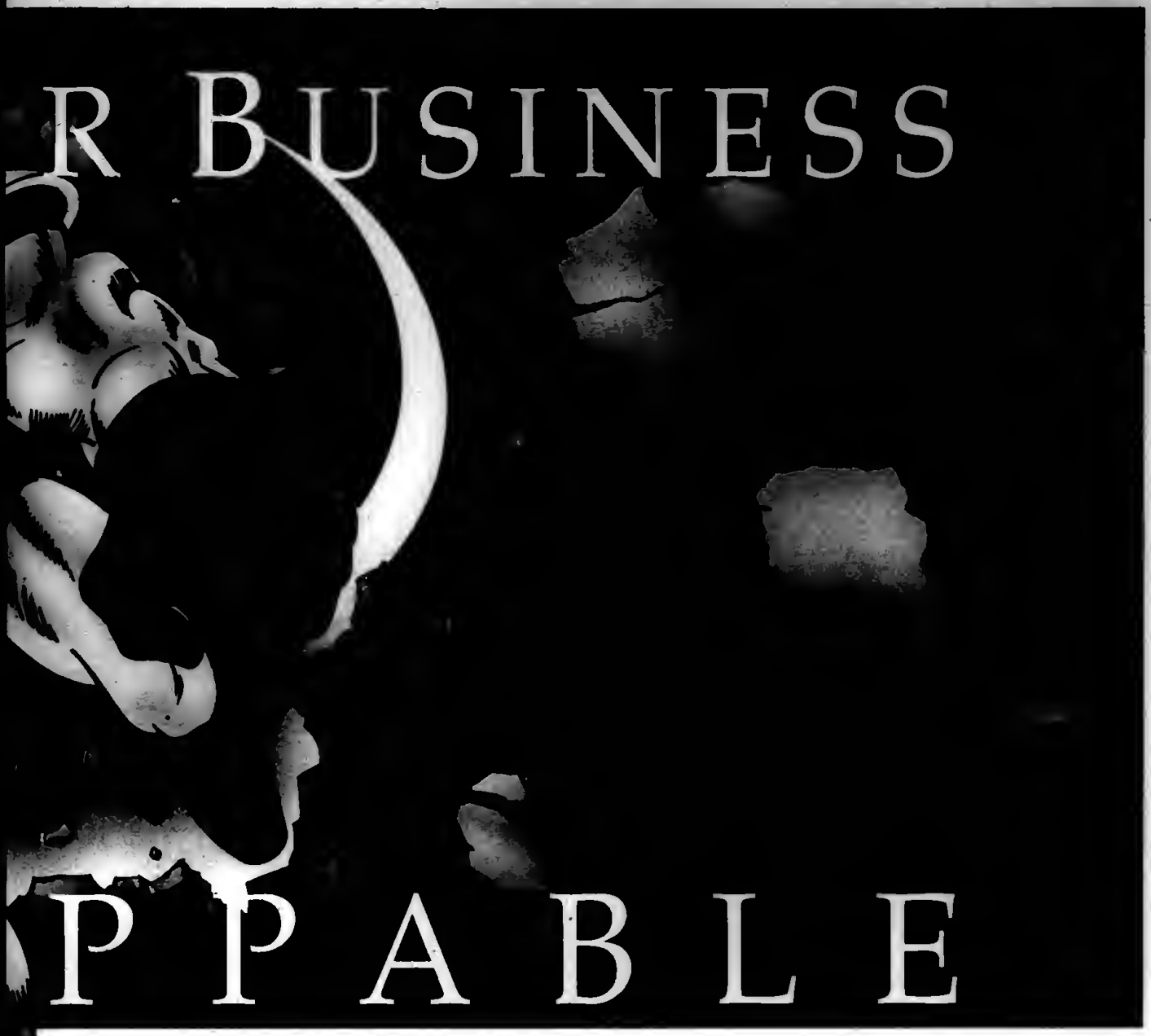

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Open hostility

Here's a little quiz. Which of the following is the most dangerous role?

a.) A machine gunner in World War I
b.) A passenger in a car driven by Ted Kennedy
c.) An oil well firefighter
d.) A vendor of open systems hawking his wares to today's IS manager
e.) Some of the above

If you guessed "d," you've probably just read our special report on open systems, which begins on page 103. If you haven't read it yet, you're in for some surprises.

The phrase "open systems" has become one of the more bastardized, loosely used and overused phrases in the business. And with its overuse has developed a deep and abiding resentment on the part of information technology professionals who are sick and tired of having "open systems" products that are anything but waved continually in their faces.

In addition, customers are leaning even more profoundly in a direction in which they prefer de facto industry standard products over products that carry (usually belatedly) the seal of approval of some standards body.

For example, when IS managers were asked which standards must be adhered to when buying information technology, de facto product standards outpointed open systems standards 2-to-1.

Still, users around the world polled for our report show an increasing appetite for open systems, judging from the portion of their budgets they expect to go toward open systems. U.S. managers say three years from now they'll spend 68% of their budgets on open systems. Our report a year ago showed a 60% figure when managers were asked to gauge open systems spending three years hence.

What explains this zeal for open systems spending while so many IS managers are mad as hell about the concept of the systems and their multitudinous false and unfilled promises? After all, only a tiny fraction of managers polled in our report say they've had positive results from open systems strategies.

The answers lie in data on intent-to-buy for operating systems. For two years in a row, Microsoft's Windows NT and NT Advanced Server have scored high. In fact, in this year's report, NT actually outpoints Unix in future intent-to-buy preferences.

Is NT open in the usual sense of the word? Not by a long shot. In fact, in our ratings of 11 major vendors in which we calibrate their commitment to openness, Microsoft comes in dead last.

Users obviously don't care. Their definition of open is simply something that works well with most everything else they want to buy. And when you are the near-monopoly that Microsoft is, the rest of the industry has no choice but to rally around your open standards, just as it did 20 years ago with IBM.

There's a message in all this, one that says that many formal standards-setting bodies have failed the customer. For better or worse now, standards seem destined to be set in an open market free-for-all.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *blaberis@cw.com*

Mad about the Mac

Regarding the editorial "Core competence" [CW, Aug. 22]: Sure, Apple could focus more, but I'm not buying all the prophecies of mediocrity for Apple. PCs are still a long way from even entering the contest on the Macintosh's main features.

I just sympathize with poor, stifled Intel processors sold like 400-horsepower engines transplanted into grandma's Dodge Dart. RISC gets more done with less fuss.

Preemptive multitasking is supposed to come to the Macintosh next year with the "Copland" system software upgrade. And Copland won't be trying to catch up to the Mac, it'll be leaving behind a cloud of dust for Chicago to eat — once it arrives.

A whole industry fears the day when the world wakes up and realizes that the 1980s-era PC is costing us incredible sums of money. Purchase price is a much smaller piece of the equation than support costs and productivity.

When Intel is forced to go true RISC in a couple of years, it will become clear that it's time to build a new foundation for the nation's desktops.

Bryn Beorse
Aberdeen, Wash.

I found "486 add-in board for Power Mac shown; takes up vital slot" [CW, Aug. 8] an insult.

I try to ignore your attitude that the Macintosh should be used only for toys, a great example of which is the statement, "That slot, known as the processor direct slot, normally supports graphics boards and other trinkets popular with Macintosh users."

I use my processor direct slot to give me high-speed access to the processor, which is what buses are for. I don't place any trinkets there, nor do any of my clients. They use it for what it was intended.

Try presenting objective news not stupid opinions. At least I can run PC applications on my Macintosh. Too bad you can't run Macintosh applications on your PC.

Jacques Giraud
Mississauga, Ontario

It was truly astonishing to see "The CW Guide to Multimedia" [CW, Aug. 1] with barely a mention of the Apple Macintosh as a multimedia authoring platform.

I am appalled at the consistent omission of solid Macintosh information in *Computerworld*, as in other industry publications outside the Macintosh community. *Computerworld* and others will report Apple financials, but apart from that, only negative Apple news makes it past your blinders. And none of the good third-party Macintosh applications are discussed.

Windows is the easiest nondecision for noninformed buyers to make. The trade press and analysts find it easy to buy into this ignorance rather than give readers genuine information that may complicate purchasing decisions.

I wish I had a nickel for every time I hit another idiot problem in Windows that Apple solved years ago, offering reasonable-length file names and ways of installing software and extending the operating system that don't involve obscure edits in long, fragile text files.

Many or most of *Computerworld*'s readers don't have the technical knowledge or expertise, let alone the time, to perform a solid market review. You have to provide that for them.

Andrew D. Wolfe Jr.
Salem, Mass.

Powerless Mac

About Charles Babcock's "Back door swings open for Mac" [CW, Aug. 29]: While the machine at home might be a Macintosh, it is more likely to be a Gateway 2000 or other brand Windows PC equipped with a CD-ROM with an industry standard architecture bus running Video for Windows, included free with most video CD titles.

The IS manager's machines at work have all the same equipment and capabilities, standard from hundreds of vendors.

The Power Macintosh hasn't changed anything. It is still a proprietary machine in a world moving to open systems. It's just a faster proprietary machine.

As for IBM and Apple deriving a common architecture for use of the PowerPC chip, it's too late. IBM made an open spec called PowerPC Reference Platform (Prep), and Apple chose to go its way, the proprietary way. They will always be proprietary.

The Power Macintosh is not prolonging Apple's life; it is prolonging Apple's death.

Daniel M. Kluth
Director,
Information Systems
Montage Media Corp.
Bayonne, N.J.

A voice for transcription

The request for textual transcription of voice mail ["Wysiwyg," CW, Aug. 8] is valid.

In this age of the information superhighway, why is there an obsession with phone and fax communication coupled with a disdain for E-mail? Those who refuse to consider linking voice mail to E-mail are the lazy ones.

Dave Ray
Fort Lauderdale, Fla.

Failure fantasy

In "If I fail, you fail," [CW, Aug. 1], Larry Runge is telling the same old story about why information technology projects fail — because of the unknowns of what technology projects will deliver and accomplish.

Runge's position is that the business manager and information technology manager be held accountable to a technology project's goal of a 30% reduction in head count. To be successful in such an endeavor, the business operation needs mapping to determine who does what, where, when, why and how. Metrics — how many of these, how many of those — for the operation must be collected. Those who perform the work today must be asked, "How can I make your job easier?" This allows the workers to model how they want to do their jobs tomorrow.

Thus, you have a man-machine model. After adding in the metric projections, one can analyze and determine the resources needed in the new environment that address the issue of anticipated savings, if any.

Also, in Runge's examples, the expectations of management were not factored. There have to be objectives beyond the head count reduction mandate.

The approach described above positions the business manager to control change. This warm fuzzy feeling would certainly have promoted the teamwork Runge advocates.

Joseph W. Tokarski
Annapolis, Md.

■ Computerworld welcomes comments from its readers. Letters may be edited and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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The ultimate test of technology's value

George Shaffner

At least once a week we hear from a CEO, an industry pundit or a business journalist that the multitrillion-dollar investment in high technology hasn't paid off — yet. At least once a year (budget submission time), our informed and impartial protestations to the contrary are met with abject unfairness — meaning a dictatorial, top-down demand for some sort of actual proof.

CIOs, who now have a career half-life of mayfly proportions, have known for a long time that the aggregate return on high technology, much of which is qualitative — across 30 years of investment — and much of which was indirect, cannot be distilled into a spreadsheet. Any such result is so full of assumptions that anyone — CEOs, CFOs and your hairstylist — could shoot holes in it.

There is a way to make the case. Let's ask a few volunteer corporations to simply shut their systems down; all of them!

A randomly selected, unbiased study team will be standing by with the cash registers, typewriters, slide rules (no calculators!), pencils and paper to replace our volunteers' lost computing capacity. For control purposes, identified competitors will continue to use their unproductive PCs, LANs and even an occasional mainframe. Then we will periodically ask the study team to compare financial performance of the two.

Some suggested pairings might include the following:

- The New York Stock Exchange and NASDAQ. Each trade 200 million to 300 million shares per day. One of them should certainly be willing, in the interest of important international research, to revert to the paper-based procedures that worked so well for centuries.
- American Airlines' Sabre and United Airlines' Apollo. One of them should be willing to process 200,000 reservations per day with kinder, friendlier, pre-World War II methods.
- Sears and Wal-Mart. Not only is this an industry that worked for millennia without computers, our volunteer can probably get rid of all those pesky credit cards!

Your staff will think of computers in economic terms and better understand other's jobs.

Of course, costs would skyrocket and revenue would plunge. The volunteer companies would be out of business in months, and investors would lose billions. But we would finally prove that the return on high technology investment has been astounding.

On reflection, this may seem a bit severe.

There is, however, another way. With your controller's help, you can construct a financial model of what it would cost your employer to return to the paper chase. Forget the lost sales, the crippled product development and the skyrocketing receivables problems; just quantify the cost of additional personnel needed to run the business. Then compare the results to what your company is spending to run its business today — with computers. You will have proved your case — without the closedown. Along the way your staff will learn to think of computers in economic terms, and everyone will get a better understanding of everybody else's job.

Finally, when you've buried that absurd lament in the company archives for good, you can move on to the real question: Why hasn't all of this investment delivered significant competitive advantage? The answer to that question, by the way, would make a great introduction to your next budget submission.

Shaffner is former chief operating officer at X/Open Co. and is now an independent consultant in Fairfax Station, Va.

Today's dreams, tomorrow's winners

Esther Dyson

One of my favorite artifacts of the computer business is the "Hawaii Tapes," a video of the internal sales meeting Apple held in the islands just before launching the Macintosh. It was quite an event: Bill Gates, Mitch Kapor and Fred Gibbons were there, playing what was probably a copyright-infringing version of *The Dating Game*.

Steve Jobs was there, sitting on a tall stool emceeing and asking the three guests leading questions about what they wanted in a hardware partner. "What are your three favorite letters?" Steve asked.

"1-2-3," Mitch replied.

"M-A-C," Bill replied, dutifully (as far as I recall).

And, "S-E-X," answered Fred, almost falling off his chair laughing.

People mistakenly look for tomorrow's winners among the winners of the past.

From 10 years later, they all look incredibly young and cute.

The tape isn't for sale, of course, but you may have a friend who could get you a copy. Or perhaps there are sources on the Internet, along with gigabytes and gigabytes of other stuff.

The point of this story, however, is not to impress you with insider gossip but to call attention to an interesting irony: Of the three panelists' companies (Lotus, Microsoft and Software Publishing), only one ever had much to do with the success of the Macintosh, and the real driving force, Aldus, wasn't even on the stage (and has since been acquired by Adobe).

It's an irony worth pondering as people search for the next Killer App. Surely it will have something to do with the Internet, the next Killer Platform. But chances are it won't come from a company you've heard of. People tend to look for tomorrow's winners among the winners of the past, but the past is usually the wrong place to look. The winners of the past are busy sitting on dinosaur eggs waiting for them to hatch.

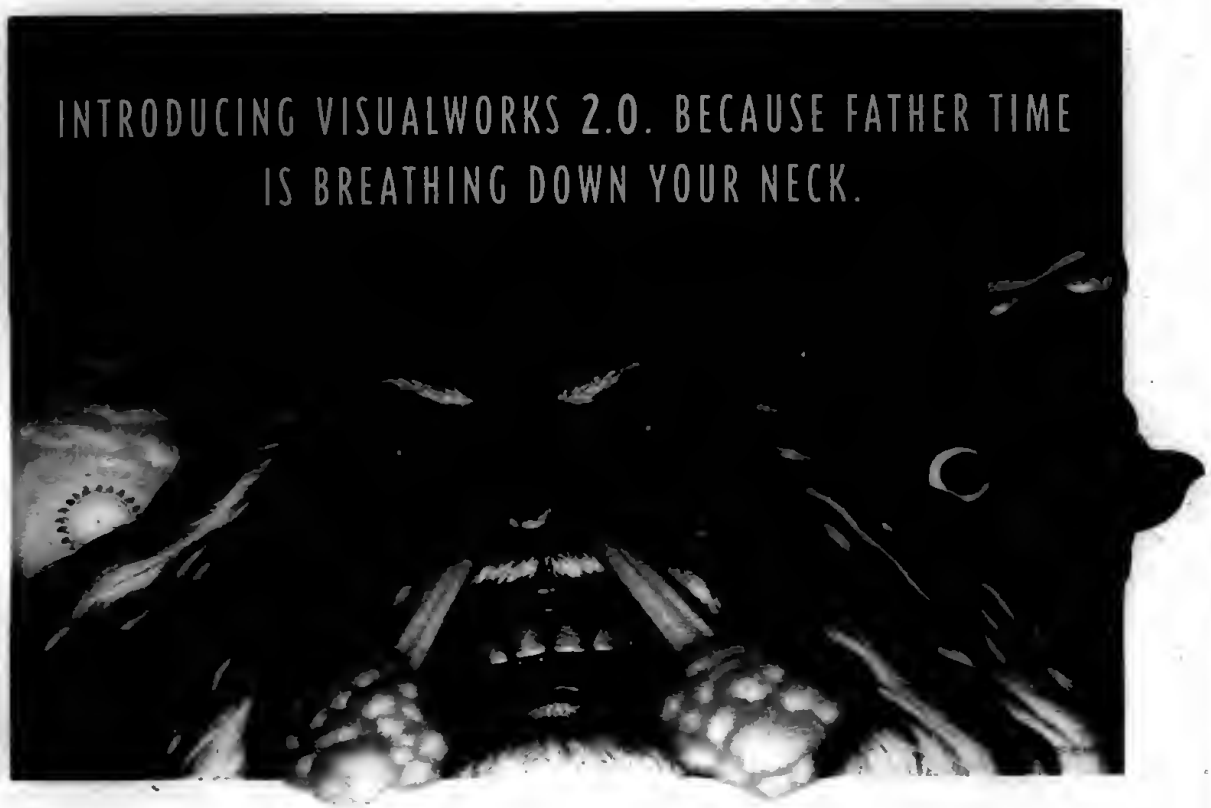
But the victor of the future is today hidden among hundreds of *losers* of the future. The winner is the business with the product that is unlike any other, has no installed base to protect, has weird and untested ideas and works on a new technical platform. Of course, most companies like that disappear without a trace, but the survivors are the success stories of the next generation.

Indeed, chances are even the business model itself will be different on the Internet platform. Given the complexities of copyright and intellectual property laws, and the ease of information transmission, the winning "thing" may not even be a product but some kind of service or information flow. The winning business may have subscribers rather than purchasers; it may even have "members" (a la American Express). It could be an electronic marketplace where the market owner sells buyers and sellers access to each other, with some rules set and enforced by the market owner. The winner is unlikely to be just one more software product.

So dream broadly!

But the Hawaii tapes do teach one other point: Maybe Microsoft could be an exception, at least for one more round. It was Aldus the newcomer that created the Macintosh, but it's Microsoft that now dominates the Macintosh application market.

Dyson is president of EDventure Holdings, Inc. in New York. She welcomes readers' thoughts and can be reached on the Internet at edyson@eff.org



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Warp gets OK from beta users

By Ed Scannell

■ Beta users are generally impressed with the speed and performance improvements IBM's Personal Software Products group has built into the latest version of OS/2, code-named Warp.

IBM's goal with Warp was to get a full-featured version of OS/2 to run comfortably in 4M bytes of memory. Most users believe the company has succeeded, but they harbor few illusions that 4M bytes will be enough to take full advantage of the operating system's capabilities and still deliver acceptable performance.

"If all you are doing is running a couple or three garden variety desktop applications, I think you'll be happy. But you'll still need 8 [M bytes] if you hope to do multitasking," said John Handy, a technical consultant at a large utility in Gaithersberg, Md.

Key features

- **Launch Pad** — Gives users easy access to frequently used applications and system functions.
- **Win32 support** — Lets users run 32-bit Windows applications. Compatible with Microsoft's Win32 API.
- Compatible with Microsoft's Windows for Workgroups 3.11.

Memory limits

While IBM has reportedly made significant strides in improving Warp's performance, company officials acknowledge the product does have limitations when running on 4M bytes.

"Not to mislead anyone, but users won't be able to run six apps with a couple of communications programs running in the background. That won't be the case. But if you are looking to run two or three applications in 4 megs, you'll be fine," said Wally Casey, IBM Personal Software Products' marketing director.

Performing better

Today PCs shipped to corporate accounts typically contain 8M bytes or more. Users in corporate sites said Warp's performance improvements make it a much more competitive offering for existing machines, especially for running DOS and Windows applications.

"We use a lot of Windows programs like WordPerfect for Windows 6.0 and WordPerfect Office. And with this beta, the speed has been increased tremendously," said Paul VanDyke, a PC technician working for the city of Kodiak, Alaska.

Not everyone on Kodiak Island is completely happy, however. Chris Brewster, another PC technician, appreciates the product's improved speed but said the beta is not always stable when running Windows applications.

Warp, *page 40*

New offerings fuel revival of PIM

By William Brandel

The fact that personal information managers (PIM) are now being bundled into applications suites must mark the maturity, and therefore, the demise of the PIM market, right? Hardly.

True, Lotus Development Corp. has been bundling Organizer with SmartSuite for more than a year. And Microsoft Corp. has bundled a scheduler with Windows for Workgroups.

However, the PIM market is about to be reinvigorated with a number of new offerings and packaging.

For example, WordPerfect, the Novell, Inc. application group, will bundle InfoCentral, the PIM it acquired when it bought SoftSolutions Technology Corp. last year, into its PerfectOffice applications suites. IBM will bundle a PIM in the next version of OS/2. Both are expected out in October. Borland International, Inc. is also trying to rejuvenate the Sidekick product line, having already rolled out a Windows-based version of the product.

A ways to go

Despite the competition and the suite bundling that has marked the maturation of other desktop software categories, analysts said the PIM market has yet to hit its stride.

"The market for PIMs is still growing," said Karl Wong, an analyst at Dataquest, Inc., a market research firm in San Jose, Calif. Wong said the PIM market grew by almost 73% last year. He said he believes that despite the giveaway no-

PIM, *page 40*

Users welcome Traveling Software's LapLink for Windows

By Michael Fitzgerald
BOTHELL, WASH

Traveling Software, Inc.'s first foray into the Windows realm appears to be a winner. Its new LapLink for Windows has received strong reviews from beta testers and analysts.

"It's a real nice product and fills an important niche in what we do," said Tom Balzarini, PC coordinator at Associated Grocers, Inc., a grocery cooperative in Seattle. Balzarini said the ability to synchronize files will be a particularly useful feature. He also said the product seemed very intuitive to use, a plus for his company.

"A lot of my guys are not interested in technology, they're interested in cabbage. So for them [the ease of use] is really sweet," Balzarini said.

Speed it up

The new product offers users LapLink's traditional file transfer capability, speeded up with an algorithm called SpeedSync, along with remote control software and file synchronization [CW, July 18].

LapLink for Windows supports multiple sessions. Mark Eppley, Traveling Software's founder, chairman and chief executive officer, said that the product could facilitate information center tasks such as help desks and network administration.

It will also let today's 386 and 486 users run Chicago, the next version of Windows, from a remote terminal, which may prove useful for corporations that do not want to upgrade their large installed base of PCs to Intel Corp. Pentium-based systems.

Opening doors

Analysts said the product seems to have the potential to open up new areas of support and service for information systems managers.

"This could be huge," said Kimball Brown, an analyst at Dataquest, Inc. in San Jose, Calif. "What you can do is just hook up to the modem on your desktop and still get access to your desktop just like you were there, and that's something a lot of people would be interested in."

Still, the product could face an uphill climb because Symantec Corp. has dominated the market with PCAnywhere, and Microsoft Corp. has built many successful utilities into its operating systems.

"We want a good, low-cost solution, but we'd much rather have it integrated into the system than cobbled on," said John Woods, a systems support specialist at Chevron Information Technology Co. in San Ramon, Calif. Woods said he is interested in Remote Access Server, which is part of Windows NT and works with the remote clients in Windows for Workgroups or Chicago. But Traveling Software could still succeed because of memory considerations.

Mobile professionals' profile

They are city dwellers who are on the road for almost a third of their workweek

- **23%** Are in sales, as is just 8% of the U.S. labor force
- **50%** Have two members of the household employed; the average is just 19%
- **74%** Live in cities with populations of more than 500,000
- **74%** Have annual household incomes above $40,000
- **52 hours** Is their average workweek, while the national average is 44; 30% of their workweek is at a "secondary" workplace

BASE: 288 MOBILE PROFESSIONALS

Source: The Yankee Group, Boston

Sony gets set to introduce contender in PDA market

By Michael Fitzgerald

Sony Corp. will introduce on Sept. 28 the first personal digital assistant (PDA) based on General Magic, Inc.'s Magic Cap operating system, according to sources close to the company.

The sources said the device, called MagicLink, could spark the PDA market.

"Sony's been really quiet, but they seem to have done this product right," said a source who requested anonymity. "It's got the communications and input capabilities that were missing from Newton."

MagicLink features

MagicLink uses the Magic Cap interface, which features icons surrounding a "desk" that has a phone, a calendar and other icons on it. The product uses General Magic's agent-driven Telescript protocol and AT&T Corp.'s Personal Link to connect with outside services. It can also be used as a phone, thanks to a special earpiece that plugs into the unit.

Not wireless

However, MagicLink is not capable of remote wireless communications, the sources said. It will have an infrared port.

The sub-2-pound product measures roughly 6 by 8 inches, uses Motorola, Inc.'s Dragon chip and has one PCMCIA Type II slot. A pop-up on-screen keyboard makes sounds like a manual typewriter when the keys are pushed, and a lithium-ion battery gives it 12 hours of battery life. Pricing has not been set, the sources said, but should fall below $800. Sony and General Magic declined to comment.

Briefs

Daytona development

Motorola, Inc. announced the first software developer's kit for Microsoft Corp.'s Windows NT 3.5 for the PowerPC. The kit will come with a firmware kit and a Hardware Abstraction Layer kit to smooth cross-vendor PowerPC development efforts. Available now, the kit costs $195 until Nov. 30 and $495 thereafter.

Bus on the road

The Peripheral Component Interconnect (PCI) bus is going mobile. The PCI Special Interest Group said it released a guideline to adapt the PCI bus to work in reduced power conditions and smaller board space.

Cellular transmission speeds up

Motorola, Inc. said its Cellular Infrastructure Group will build Code Division Multiple Access voice transmission equipment to achieve speeds of up to 13K bit/sec. The technology, which Motorola expects to ship in the first quarter of 1996, compares to 8K bit/sec. transmission rates for the rival Time Division Multiple Access technology.

Infrared connection

Extended Systems, Inc. in Boise, Idaho, is shipping JetEye PC, a serial infrared connector that links Hewlett-Packard Co.'s 200LX palmtop to PCs and printers. It transmits data at 115.2K bit/sec. and costs $135.

PC phone

AT&T Global Information Solutions recently announced what it calls the industry's first true "telephony PC." The PC integrates a full-duplex speaker phone with speed and autodialing, external speaker/microphone, a fax/modem and a digital answering machine. The Globalyst 360TPC is aimed at business users and is based on an Intel Corp. 66-MHz 1486DX2 processor. It has up to 64M bytes of memory, a standard 420M-byte hard drive and a dual CD-ROM drive. Prices start at $1,899.

Flat-panel pact

Kopin Corp. in Taunton, Mass., announced agreements with two divisions of Philips Electronics North America Corp. The firms will develop and make full-color, active-matrix LCD systems using Kopin technology.

Warp gets OK from beta users

CONTINUED FROM PAGE 39

"Speed is its best feature. But when you start running Windows applications, it still is not stable. I assume that's because we are using Windows 3.1 and not 3.11. [Version 3.1] was never that stable in the first place," Brewster said. On bulletin boards last week, some users also complained about a variety of installation and device drivers problems with the beta. IBM officials acknowledge there are some installation problems, even with PS/2 Model 70s, which they said will be fixed by the final release.

New in the second beta version of Warp is the ability to support 32-bit Windows applications that ascribe to Microsoft Corp.'s Win32 application programming interfaces. Also new is Warp's compatibility with Microsoft's Windows for Workgroups 3.11, which allows users to install the product right on top of it without conflict.

Users' choice

According to Casey, most of the features added to the latest beta version of Warp address "touchy-feely" things that users have requested. These features include a spruced up interface that features three-dimensional icons and a simpler installation process, as well as a Launch Pad that gives users easy access to frequently used applications and systems features.

IBM has also announced it will bundle a BonusPak — a suite of 10 native OS/2 applications — with the finished version of Warp. The company has already released several BonusPak applications simultaneously with Warp that are primarily intended to benefit small business users. Some of those include the following:

- **IBM Works**, a collection of 32-bit applications, including a word processor, database, spreadsheet and graphics program.
- **FaxWorks for OS/2**, a program that lets users fax documents from within an application.
- **CIM for OS/2**, a native OS/2 version of the CompuServe Information Manager that lets users access a wide variety of informational services.
- **Person to Person for OS/2**, a conferencing software package that lets up to eight users simultaneously view and edit documents.

Based on feedback from OEMs and retailers, Casey said IBM expects to ship well over 1 million copies of Warp in the first 90 days of the product's availability, now

PIM revival

CONTINUED FROM PAGE 39

tion of bundling PIMs in suites, PIMs will continue to sell well as stand-alone applications.

In fact, as far as desktop applications are concerned, PIMs stand a breed apart.

"The success of a PIM comes down to the first letter, 'P,'" said Chris LeTocq, an analyst at Computer Intelligence/InfoCorp, a market research firm in Santa Clara, Calif. "Every individual wants their own PIM to suit them. Many end users get a PIM given to them, can't find their way around and just give up on it."

Come and get it

While PIMs have definitely benefited from the ubiquity and usability of the Windows interface, most are just now coming up to speed as usable products. In fact, CI/InfoCorp notes that the most usable application on the market is Lotus' Organizer, with 787,000 users, followed by Act from Symantec Corp., with 670,000 users. These numbers pale in comparison to other application areas, such as the 8 million users who use WordPerfect's word processor. In short, the electronic PIM market is still ripe for the picking.

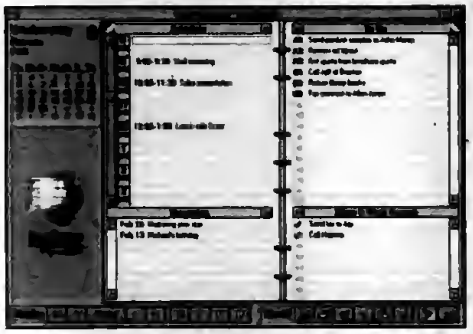
This fact has not been lost on the maker of the champion paper-based PIMs. Day-Timers, Inc. has created a new company, Day-Timer Technologies in San Mateo, Calif., which will bring its own PIM to market. Noting that PIMs have not yet met all their users' needs, Day-Timer estimates that 85% of PIM users also use the paper-based planners. Day-Timer measures its own paper-based market at more than $400 million. By comparison, the PIM market stands at about $85 million.

Analysts said that because the PIM market has yet to be dominated by any one application, Day-Timer, a late entry, still has a chance to make it. For starters, it is approaching the customer base through catalogs, magazines and direct mail, instead of trying to reach them through the same sales channels as a word processor, LeTocq said.

The advantages

Day-Timer also benefits from its customer base. The Day-Timer PIM carries the paper-based metaphor and structure into its electronic PIM version. This user interface could catch on with paper-based Day-Timer users.

"It looks very similar to my Day-Timer," said Larry Warfield, manager of integration services at Visibility, Inc. in Wilmington, Mass. "It is very intuitive if you have used Day-Timer."



Day-Timer's PIM *carries the paper-based metaphor and structure into its electronic PIM version*

Warfield said he is considering standardizing the product and buying a networkable version of Day-Timer.

"But I'm just not sure that would work," Warfield said. "Everyone has their own style of how they organize their work. We have a lot of different PIMs out there."

	ORACLE	SYBASE System 10	INFORMIX
Parallel Processing Strategy	YES	YES	YES
			YES
Parallel OLTP Software	YES	NO	YES
			YES
Parallel Index Software	YES	NO	YES
			YES
Parallel Backup	YES	NO	YES
			YES
Platforms Supported with Parallel Software	20+	Ø	25+
			YES
Parallel Resource Management and Control	NO	NO	YES
			YES
Static Database Partitioning	NO	NO	YES

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Epson America, Inc. has introduced the Epson Stylus Color, a color ink-jet printer.

According to the Torrance, Calif., company, the Epson Stylus Color produces high-definition, near-photographic images with a resolution of 720 dot/in. in superfine mode.

The printer uses one print head for monochrome and two print heads for color printing and is based on technology that uses mechanical vibrations instead of heat to fire ink onto paper.

The Epson Stylus Color costs $699.

▶ *Epson America*
(310) 782-0770

HavenTree Software Ltd. has introduced EasyFlow for Windows, charting and diagramming software.

According to the Kingston, Ontario, firm, EasyFlow for Windows lets users create presentation-quality charts and diagrams and includes Shape Libraries with hundreds of standardized industry icons.

A text-formatting feature moves and reformats when lines or shapes are repositioned. Multilevel diagramming lets users create hierarchically organized charts and diagrams.

A SmartLines feature prevents lines from crossing or interfering with other objects by searching for unobstructed paths between shapes.

EasyFlow costs $199.

▶ *HavenTree Software*
(613) 544-6035

Idea Associates, Inc. has announced the Idea Transaction Processing Workstation Family of modular, field upgradable workstations.

According to the Billerica, Mass., company, the workstations' modular design lets users select a workstation appropriate for their needs and allows them to upgrade when necessary.

Each workstation consists of a monitor and a detachable base, which houses the logic board and optional components. Modifications can be made to the base by switching logic boards, PC microprocessors, PCMCIA cards, local hard disks and floppy drives. A power management facility shuts down the workstations to reduce power consumption to less than one watt.

The three models are the Idea Transaction Station, for twin axial or coaxial connectivity; the Idea Transaction Station Plus, with advanced features and customization; and the Idea Desktop Client Station, for use in most network environments that access an IBM host or PC-based file server. It comes preconfigured with Microsoft Corp.'s DOS and Windows, along with IdeaComm emulation software.

Prices range from $1,245 to $4,500.

▶ *Idea Associates*
(508) 663-6878

Multi-Tech Systems, Inc. has announced the MT2834BA, an International Telecommunications Union-compliant 28.8K bit/sec. V.34 modem.

According to the Mounds View, Minn., company, the MT2834BA uses industry standard AT commands for modem configuration and dialing and includes a remote configuration feature so users can remotely change parameters and run diagnostics.

The modem provides V.42 error correction for error-free transmissions and V.42 data compression, yielding asynchronous throughput up to 115K bit/sec.

The MT2834BA costs $799.

▶ *Multi-Tech Systems*
(612) 785-3500

Digital Communications Associates, Inc. has announced Crosstalk for Windows with Crossfax, an integrated fax, data and Internet support product.

According to the Alpharetta, Ga., company, Crosstalk for Windows with Crossfax lets users send and receive faxes through a PC or Macintosh equipped with a fax modem.

The fax process is in the background so users can work on other applications simultaneously. Features include automatic modem detection, port sharing and automatic fax/data switching.

Crosstalk for Windows with Crossfax costs $195.

▶ *Digital Communications Associates*
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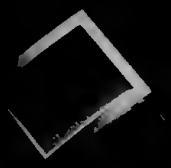

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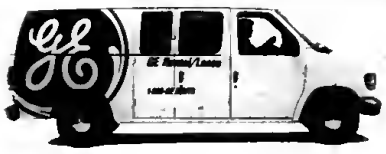

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Stan Schatt

A gift from gods or geeks?

When techies get together to decide what is best for you regardless of your company's business needs, it's a good time to be cautious. Beware of geeks bearing gifts, no matter how exciting these gifts appear to be.

Case in point: NetWare 4.x. Remember how you chafed at the limitations of NetWare 2.x? You were convinced that life would be good if only you could make your Macintosh computers full-fledged network users *and* take full advantage of the power of your new 80386 server. Voila!

To Novell's credit, it listened and provided a networking classic NetWare 386. It didn't have everything you wanted, but Novell promised that a later .0 version would add symmetrical multiprocessing, fault tolerance and so on. Thousands of network managers made NetWare 3.x the computer industry equivalent of the music world's platinum hit. Unfortunately, Novell stopped listening.

A group of techies cooked up a product incorporating all the nifty features they would want *if* they ever ran a network. Novell launched NetWare 4.x with all the pyrotechnics usually associated with a new Microsoft product or a new bath soap. The sight of 1,000 Compaq PCs running NetWare from a single server

Schatt, *page 49*

Mix-and-match workflow works

By Ellis Booker

When Credit Data Reporting Services (CDRS) re-engineered its loan analysis procedures, shrinking the time it takes to process a residential mortgage credit application from three to five days to just 24 hours, it combined a slew of imaging and workflow products from a variety of vendors.

The firm combined open, distributed computing with Unix servers and X Window System clients, workflow, document imaging and fax services. IBM Consulting Services, which served as lead integrator, helped CDRS combine 15 off-the-shelf software products with 800,000 lines of custom code.

"Instead of taking a single integrated product, the integration team mixed and matched a whole bunch of things," said Bruce Silver, director of document and image management strategies at BIS Strategic Decisions in Norwell, Mass., who was briefed by the vendors on the deployment.

Silver said that while IBM and other integrators continue to configure systems comprising "off-the-shelf" components, "there's definitely a trend to customer-driven, roll-your-own solutions . . . using tools like [Microsoft Corp.'s] Visual Basic and [Powersoft Corp.'s] PowerBuilder."

Even more significant, he said, is the fact that IBM elected to use the Plexus FlowWare workflow system from Recognition International in Sunnyvale, Calif., rather than IBM's own workflow solution. "IBM has definitely become less monolithic about pushing its own products," Silver said.

For CDRS executives, however, the project has been less about cross-vendor cooperation than operational benefits.

The $2 million project is aimed at improving customer responsiveness against other credit reporting companies that are also overhauling their core information systems.

"Traditionally, in mortgage lending, applications were filled out on paper, given to a loan officer, [and it took] three to five days to get a credit report back," explained CDRS President Don Juhl.

No more paper

In the environment CDRS is building, paper in the first step is eliminated by laptop-equipped loan officers, who take an initial application and send it to CDRS, which responds in real time in less than 15 seconds. Following this, a more extensive application — again electronically uploaded — is processed by CDRS, which is shooting for a consistent turnaround time of less than 24 hours, Juhl said.

The new system, which is built on three IBM RS/6000 AIX servers connected to some 60 X terminals used by credit agents, was specified to handle up to 80,000 transactions daily.

In fact, the CDRS system is notable in another respect, too. While it offers some imaging capabilities — through a fax management product, IsoFax, from Bristol Group Ltd. in Larkspur, Calif. — the workflow component is largely targeted at handling documents not involving images. "We only need to go to [original] image for exception reporting," said Carol Mortell, a senior consultant at IBM Consulting Group who led the six-month project.

Electric credit

Along with its new workflow-driven credit authorization system, CDRS is busy beta-testing the credit industry's soon-to-be-codified electronic data interchange (EDI) transaction standards for mortgage applications.

The X12 specification, due to be codified in the coming month or two, will for the first time allow banks, credit authorization companies and appraisal companies to communicate electronically. The new EDI format will accept not only credit information but also supporting documents, such as data on employment history. Today, most of these exchanges are handled via fax or mail. — *Ellis Booker*

Small brokerage helped by electronic imaging, printing

By Thomas Hoffman

By June 1, 1995, U.S. stock market players will be required to settle securities transactions within three days (T+3) instead of five due to Securities and Exchange Commission regulations designed to improve the industry's ability to manage credit and risk.

While meeting the T+3 deadline has become a challenge for information systems managers at many broker/dealers, Ernst & Co. in New York has positioned itself to meet the pending regulations by implementing workgroup imaging and distributed printing systems.

Ernst & Co.'s distributed printing system, from Automatic Data Processing, Inc.'s (ADP) Investor Communications Services and Output Technologies, was designed to generate transaction confirmations within 24 hours. As part of the T+3 regulations, broker/dealers will be required to send such written confirmation to their customers on or before the settlement date.

Trouble for the little guys

That is usually not a problem for brokerage giants such as Merrill Lynch & Co., which can typically cover up to 90% of its customers' transactions with asset management capital it has set aside. However, this has become more of a critical issue for smaller brokerages that lack the assets to back their customers' transactions.

"The smaller brokers are having the biggest problem adjusting to T+3, particularly those who are trying to process transactions solely with in-house systems," said Hal McIntyre, a managing partner at The Summit Group, a Murray Hill, N.J.-based management consultant for securities processing firms. But, as McIntyre pointed out, smaller firms that rely on service bureaus such as ADP's Investor Communications Services unit are starting to benefit from a recent influx of products.

Ernst & Co., which clears 5,000 to 12,000 transactions a day for 70 broker/dealers, became an early user of Rapid Confirm, a distributed electronic printing system, and went live with the system in March. In the past, staffers in Ernst & Co.'s mail room would stuff thousands of transaction confirmations into envelopes each day and mail them out to clients.

Now, Ernst & Co. processes transactions on any one of its 200 image-enabled IBM ValuePoint PCs using MicroBank Software, Inc.'s System for Transaction Optical Retrieval Query Manager, a Windows-based package that indexes and retrieves data from write-once read-many technologies where customer statements are stored.

The files are routed from the IBM ValuePoints over an IBM Token Ring LAN network running Novell, Inc.'s NetWare 3.12 network operating system and transmitted over leased-line connections to ADP's brokerage network. Once there, the information is batch-processed and forwarded over T1 connections to the Output Technologies unit.

The data is then reprocessed into an electronic forms format by Output Technologies and transmitted to one of six regional operating centers around the country. The statements are printed, inserted and mailed through the U.S. Postal Service.

Newfound efficiency

The entire Rapid Confirm delivery process takes less than 24 hours. Before, it often took days before Ernst & Co.'s confirmations were mailed to customers. "We were in the Dark Ages — it wasn't economically efficient, and we weren't making good use of our time," said Mitch Miesler, Ernst & Co.'s vice president of marketing.

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Briefs

Arcada product redesign

Arcada Software, Inc. sped up its Backup Exec for NetWare-Enterprise Edition 5.0 by using a design that offloads the burden of processing from the main server to remote servers. It also added the ability to back up Microsoft Corp. Windows NT machines to a Novell, Inc. NetWare server.

Strategic drops Atlas price

Strategic Mapping, Inc. in Santa Clara, Calif., dramatically cut the price of its Atlas GIS desktop mapping software from $1,595 to $495 to position it as a mainstream PC application.

X terminals from Tektronix

Tektronix, Inc. has announced a series of low-end X Window System terminals designed for use in large commercial sites. The XP200 series, priced from $1,095 to $2,495, is based on Mips Technologies, Inc. R3000 RISC processors. Now in beta testing, the X terminals are set to ship next month, according to Tektronix.

McAfee upgrades NetTools

McAfee Associates, Inc. introduced NetTools 5.0, a new version of its Windows workstation management application for Novell's NetWare LANs. The software release supports new software distribution and configuration management features aimed at automating tedious configuration tasks. The product is available now and is priced from $27.95 to $40 per node.

Digital gets award

The X/Open Foundation awarded Digital Equipment Corp.'s OpenVMS 6.1 operating system with XPG4 Base Branding status. Digital beat other non-Unix systems to the punch as well as IBM's AIX and Sun Microsystems, Inc.'s Solaris. The certification will help "convince customers that to get to openness, there's no reason to go elsewhere," said Jonathan Eunice, an analyst at Illuminata in Hollis, N.H.

Hewlett-Packard pays off

The Aberdeen Group consulting firm reported that mainframe software companies rewriting to Unix derive more revenue from Hewlett-Packard Co. programs than from programs they write for IBM or Sun Microsystems Unix boxes.

Company size, LANs linked

The majority of European businesses with fewer than 100 employees have not yet installed a LAN, according to a large-scale information technology customer survey by market researcher International Data Corp. (IDC). The survey results indicate a direct correlation between the size of an organization and the likelihood of having a LAN installed, according to Pim Bilderbeek, director of IDC's European Network Expertise Center in Amsterdam. Information was gathered from approximately 8,600 information technology customer sites in the UK, Germany, Italy, Belgium, the Netherlands and Sweden. The results showed that while LANs were installed in 38% of companies with 10 to 19 employees, they were installed in 89% of companies with 1,000 or more employees.

Siemens offers Unix software

Siemens/Nixdorf Informationssysteme AG (SNI) is now offering a Unix version of its Siline mainframe business administration, production planning and control system, according to the company. The software runs on SNI's RM-series of Unix servers and workstations, which operate on SNI's Unix implementation Sinix, as well as on the company's BS2000 mainframes.

HP offers video server

Hewlett-Packard Co. said CBS, Inc.'s WCIX-TV Miami is installing its digital video broadcast server, replacing a video tape recorder system. The HP server provides up to 51 hours of programming and uses Motion Picture Experts Group's compression. Earlier this year, CBS affiliate KOLD-TV in Tucson, Ariz., and the Radio Television Luxembourg network RTL2 in Munich, Germany, also committed to the HP video server.

Schatt

CONTINUED FROM PAGE 47

was impressive. Something surprising happened, though. The vast majority of NetWare 3.x network managers didn't buy it.

I'm convinced that what the majority of NetWare 3.x users really want is tried-and-true, better-than-ever, NetWare 3.2. There's a customer refrain you can hear rising above the din of advertising hype: "Everything is working OK. Improve some basics, but don't make my life more complicated. Let me print a bit more efficiently and improve my remote communications, but don't make me start all over again."

> Users don't want to be sold a product one year and then have the vendor return two years later to say the product was good in its time but is now obsolete.

Upgrade or die

The marketers and techies at Novell have come up with a plan that NetWare 3.x users will like even less than NetWare 4.x. Imagine a time in the not-too-distant future when word comes down from Provo, Utah, that the fate that befell NetWare 2.x users now faces NetWare 3.x users — upgrade or face a fate worse than death: no support and no enhancements.

Recently I pleaded my case to the architects of Novell's NetWare 4.x plan. "Why throw out the baby with the bathwater? Improve NetWare 3.x by adding some key features, but don't require everyone to upgrade," I said. Let's face it. Coca-Cola and the Acme Clothing Rack might both have NetWare 3.x LANs, but they have very different needs. Some of NetWare 4.x's features are perfect for enterprise networks but not required for the LAN down the block with 50 nodes. Why not just sell 4.x as Enterprise NetWare to those customers who need its feature set and let the large number of NetWare 3.x customers who are relatively happy upgrade to 3.2?

"Everyone needs 4.x," I was told. The speaker then recited in mantra-like fashion a list of features that *everyone* would want. When I pointed out that most midsize and smaller LANs really had no need for directory services or compression for storing images, I was told what appears to be the real reason for migrating all users to 4.x: "We don't want to support two platforms indefinitely."

Let's assume you buy Novell's argument and upgrade to 4.x. Guess what? Your NetWare salesperson will be back in a couple years to sell you the next version (a hybrid of NetWare and Unix). Of course you'll need to upgrade to take advantage of all the terrific products that will work only with this new, improved version.

You see, Novell is in a very ticklish situation right now. Its flagship product lacks the scalability of Microsoft's Windows NT Advanced Server and in its present form has reached a kind of evolutionary dead end. It must go through a couple of moltings (remember the ugly caterpillar and the beautiful butterfly?) to become a network operating system platform for the rest of the '90s. Novell wants all its customers to upgrade twice during the next few years. It keeps the cash registers ringing and provides full employment for the marketers and techies.

Upgrade for the right reasons

But managers need to upgrade their network operating systems for the right reasons. Do you need to run an application that requires the newest version? Do you have enough users and network resources to require directory services as well as some of the other NetWare 4.x features? If you answer yes to these questions, upgrade immediately.

On the other hand, if your network runs fine and everything is under control, there is little reason to work nights and weekends to go through the hassle of migrating to 4.x.

I sense that a rebellion is brewing among network users that extends to intelligent hubs and other network products as well as network operating systems. Users don't want to be sold a product one year and then have the vendor return two years later to say the product was good in its time but is now obsolete and must be replaced.

A techie can dream up a marvelous product filled with all kinds of bells and whistles, and marketers can dream up all kinds of reasons why you wouldn't want your network to be caught dead without this new product. Still, it is the network manager who must justify the expense, spend the time implementing the product and face the wrath of irate users when things don't work as well as they did before the change.

Schatt is a LAN service director at Computer Intelligence/InfoCorp in La Jolla, Calif.

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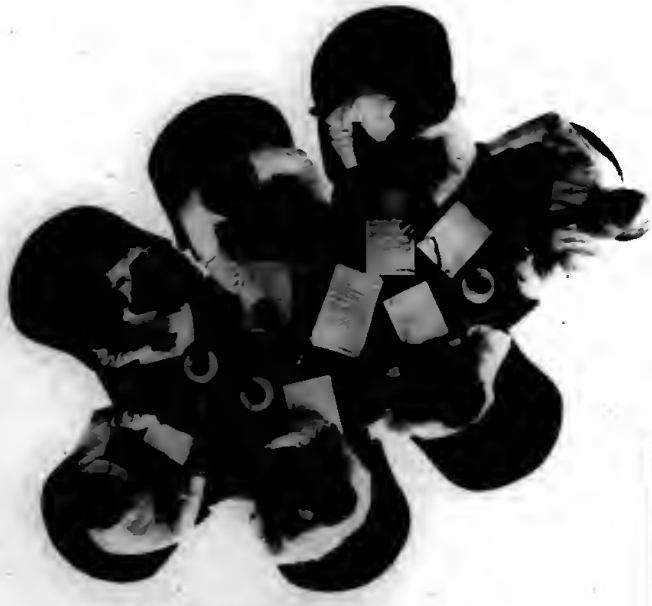

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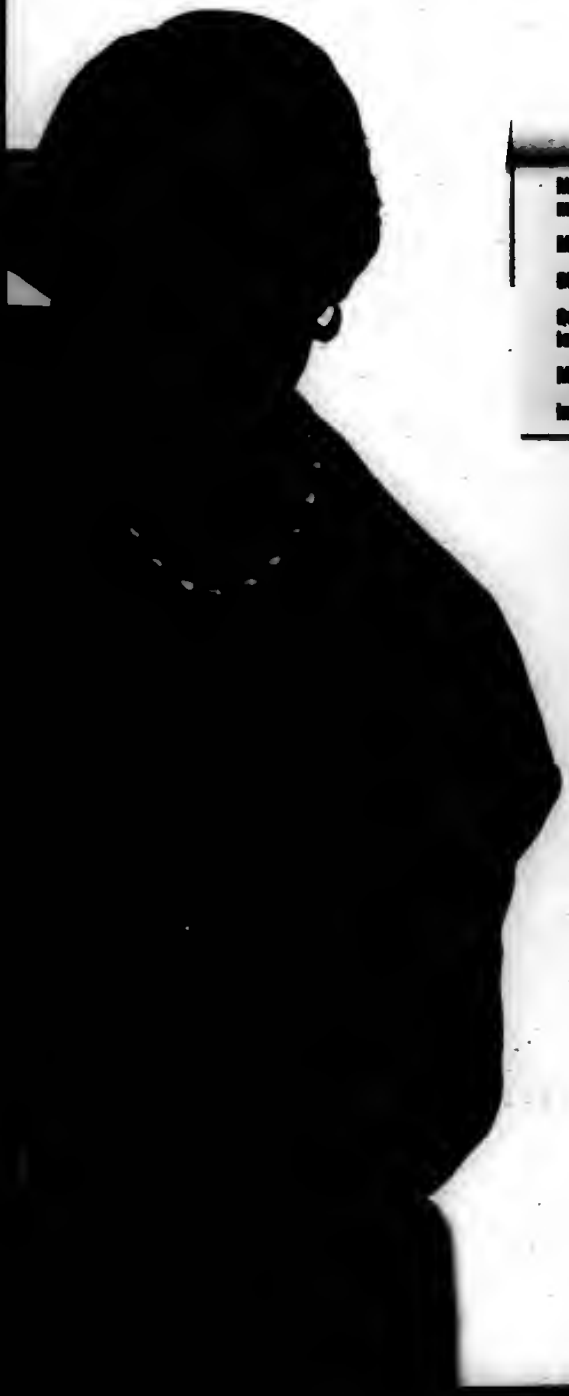

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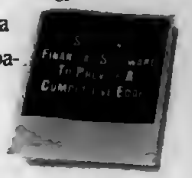

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Lannet, Cabletron unveil switch modules

By Stephen P. Klett Jr.

■ The switching craze continues as Lannet, Inc. and Cabletron Systems, Inc. unveiled next-generation switching modules for their respective hub platforms.

Lannet, based in Irvine, Calif., unveiled a four-port switching module for its MultiNet hub family called the LANswitch LSE-404S. The module joins Lannet's line of port-switching modules, which provide 10M bits of dedicated bandwidth to users' desktops.

The 404S was designed to allow MultiNet users to scale their network bandwidth from shared networks to collapsed backbone segment-switched networks. A MultiNet chassis can house up to 16 modules supporting 64 LAN segments.

"Lannet has come out with a good, practical product that can be configured in almost any way a user wants — from a low-end workgroup switch to a campus switch to handle the needs of an entire building," said Jordan Stone, an analyst at Infonetics Research, Inc. in San Jose, Calif. "This is important to preserve users' existing investments."

Segment switches such as LANswitch reduce network congestion by breaking large Ethernet shared LANs into smaller segments. The switches reduce network traffic by forwarding only packets addressed to nodes on other segments.

"We've got 150-plus power-hungry, bandwidth-hungry, graphics-intensive workstations ... and we want to migrate everything we've got on shared Ethernet and put it into the switch," said Ron Willhoite, network administrator at BSW International, Inc. in Tulsa, Okla. He expects the 404S to eliminate redundant hardware such as bridges and provide a performance boost by eliminating network hops.

In the works

Lannet also plans to release 100M bit/sec. Ethernet and Fiber Distributed Data Interface modules by year's end with Asynchronous Transfer Mode modules to follow in the first half of next year.

Lannet also unveiled a port-switching version of the switch, called the LANswitch LSE-404, which can be used to provide dedicated 10M bit/sec. connections for workstations or departments. Both switch modules will ship next month at prices starting at $3,995.

Not to be outdone, Cabletron — No. 2 in hub market share — announced its own segment switching module for its MMAC-Plus hub.

The Ethernet MicroLAN Extension module supports up to three Ethernet segments. Up to 14 modules can be housed in a MMAC-Plus chassis. Each module has an on-board Intel Corp. 1960 processor.

Initially, the module will support IP and DECnet routing with support for Apple Computer, Inc.'s AppleTalk and Open Shortest Path First expected in the first quarter of next year. The MicroLAN Extension module will ship in the fourth quarter of next year for $9,995.

Network merger in bank's best interest

SNA net consolidation pays for 500 more branch ATMs

By Suruchi Mohan

At the Bank of Montreal, customer service and empowerment of staff were the driving factors in its network consolidation. Outright cost savings were a secondary consideration.

Before the consolidation from two networks to one began in 1992, the $124.8 billion bank, one of the 10 largest in North America, ran two parallel IBM SNA networks. One network, which supported teller terminals in 1,200 branches, was composed of 160 multidrop, 9.6K bit/sec. SNA lines that ran up to 12 controllers per line.

Bank of Montreal's *Les Llewellyn (left) and Peter Chislett were a part of group responsible for net consolidation*

Serving the same locations was another network that handled traffic between mainframes and automated teller machines (ATM). This, too, was an SNA network, but with 2.4K bit/sec. multidrop lines supporting six ATMs on each line. At that time, most of the ATMs were in the branch offices.

That network was eliminated and its traffic shifted to share a network with the branch tellers, said Peter Chislett, a specialist in the communications department at the Bank of Montreal in Scarborough, Ontario.

Ahead of schedule

Initially expected to take a year, the consolidation took a mere 20 weeks to complete as implementation teams in Calgary, Toronto and Montreal fanned out to smaller cities, according to Chislett. The total project cost less than $8 million, 50% of which was spent on equipment. Once in place, the new network was expected to save the bank $4 million a year in telecommunications costs.

The bank reinvested those anticipated savings to add 500 ATMs to its 1,200 branch machines, allowing customers to reap some of the benefits of the consolidation. Without that consolidation, "we wouldn't have been able to invest in more" ATMs, said Larry Frost, manager of Instabank operations and a heavy user of the bank's technology.

The bank has several other networks, and some are linked. SNA forms the communication backbone at the bank, while Novell, Inc.'s NetWare is the basis for departmental LANs that provide office support and automation for the corporate offices.

Some NetWare LANs and Unix networks are used in the treasury area, where the bigger customers perform trading and processing transactions. Some of these LANs are stand-alone, while others use Synchronous Data Link Control (SDLC) gateways or routers to connect to the mainframes. In addition, some OS/2 LANs run adjacent to the SNA network.

The bank had looked at branch and ATM consolidation as early as 1986. Les Llewellyn, unit manager for corporate wide-area network management, said the bank had to find a technology to support a concentrator at each branch office and start the consolidation from there. "We looked at some products but couldn't make a business case," he said.

In the 1991-92 time frame, the business systems and systems operations groups developed a loan application and put it to limited use in the branch offices. This triggered the consolidation effort. The bank did not want to have

Bank, *page 57*

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Jim Bessen, "Riding the Marketing Information Wave" *Harvard Business Review* September-October 1993

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DG inches its way into telecom market

By Mary Brandel

Data General Corp. expanded its systems integration offerings recently with the addition of worldwide, data-only, point-to-point and multipoint telecommunications services, including frame relay.

But this is far from an entry into the telecom market, the company said.

"We're using this as a differentiator" from other systems vendors, said Steve Kruy, DG's manager of telecommunications. "We have had a global network in place for well over a decade for internal use, and since we have a presence around the world, we're offering this capability."

Target customers are international companies that need to expand their networks. However, Kruy stressed that most customers would likely purchase the services along with other DG offerings, such as Aviion servers and consulting.

That was the case at George N. Jackson Ltd., a home fashions wholesaler in Winnipeg, Canada. The company upgraded its real-time order-entry and inventory control system from a Unisys Corp. mainframe to an Aviion server. In addition, it dropped its X.25-based packet-switching network and implemented DG's high-speed, 56K to 192K byte/sec. cross-Canada services.

"The pricing for higher-speed services was less than what we'd get on our own," said Gerry Stevens, vice president of finance at the firm. In addition, he said he liked the idea that DG would monitor and maintain the whole network.

Low to high

Pricing for Data General's expanded network service ranges from $320 per month and 45 cents per mile at 4.8K byte/sec. to $3,270 per month and $4.90 per mile at 2,544K byte/sec.

"Previously, we were dealing with [four or five] different telephone companies" and equipment suppliers, he said. "Whenever we ran into problems, each pointed fingers at someone else."

Other customers expressed interest.

"I can see where it would be useful for smaller users like myself who don't have expertise or personnel to set up a network," said Tim Boyer, data processing manager at Denman Tire Corp. in Cleveland.

Safe and secure?

There are some caveats, however. Security is one. When piggybacking onto someone else's network, "you have to keep in mind how you're going to keep both sides secure so that information isn't going to somehow be exposed," said Bob Johnson, associate director of software services at Dataquest Worldwide Services Group in Framingham, Mass.

Competitive advantage is another. "The infrastructure looks very good right now, but customers have to make darn sure that the enhancements are going to keep up with industry norms," Johnson said. Speed, access and flexibility are all areas to check into.

Just in case, he said, customers should make sure they have a fallback option.

In the future, DG said, it will add electronic mail and electronic data interchange services.

One analyst suggested that DG was trying to fill unused capacity on its internal network. "A number of years ago, DG tried to get into networking and built an incredible internal network for themselves," said Bob Sakakeeney, an analyst at Aberdeen Group in Boston. "They still have the network in place with tremendous excess capacity."

Kruy denied that statement. In fact, if a potential customer "said he'd like connectivity and we needed to expand the network or provide additional capacity, we would do that," he said.

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StrataCom server accesses frame-relay nets

By Stephen P. Klett Jr.

StrataCom, Inc. recently unveiled a network server said to provide end users with low-cost access to frame relay-based wide-area networks via Integrated Services Digital Network (ISDN).

The Intelligent Network Server (INS), which will be sold to communications carriers, consists of a Unix-based workstation and software modules that support a variety of network functions, such as dial-up frame relay and switched virtual circuits.

When used with StrataCom FastPacket switches, INS offers users a low-cost alternative to dedicated leased-line connections to frame-relay networks, which cost roughly $500 per month, analysts said. INS can provide remote users with access on an as-needed basis via ISDN for less than $100 per month.

"Users are clamoring for this type of product even though they may not realize it yet," said Henry Matthes, a director and principal analyst at Dataquest, Inc. in San Jose, Calif. "Frame relay and ISDN are absolutely taking off, and products such as this are essential to expand [carrier] coverage." INS is ideal for applications such as remote connectivity and dial backup for dedicated frame-relay services, Matthes said.

The support for switched virtual circuits is also important because virtual networks make routine functions such as moves, adds and changes simpler. And that translates into cost savings, he said.

CompuServe, Inc.'s Network Services Division in Columbus, Ohio, announced plans to use INS to offer customers dial-up, frame-relay service at speeds from 64K bit/sec. to 128K bit/sec. Pricing and availability details were unavailable.

A minimum configuration of a Sun Microsystems, Inc. SPARC 5 workstation with 16M bytes of RAM, 530M bytes of disk and a High Speed Interface card is required to run the $15,000 server software. INS field trials will begin in the fourth quarter, with general availability slated for the first quarter of next year.

Bank of Montreal

CONTINUED FROM PAGE 53

stand-alone PCs run customer service-type applications in the branches. However, it could not afford yet another line to link these PCs to the SNA network.

That is when the bank decided to use Motorola, Inc.'s Communication Access Point (CAP), also known as the 6525 packet assembler/disassembler. The major strength of the product was that it was software driven: It could be upgraded to support different protocols without upgrading the hardware.

Additionally, Motorola had developed a proprietary version of the X.25 protocol that supported packet switching in a multidrop environment. Standard X.25 is point-to-point, which for the Bank of Montreal would have meant a complete overhaul of the network topology. Finally, Motorola developed a flavor of the communication protocol, called XDLC, which allowed X.25 and SDLC traffic to run on the same line.

To the limit

However, all this complexity posed a network management problem. The large number of CAP devices made the network so large that it pushed the limits of the bank's network management system.

The short-term implications of this consolidation were that the telecommunications lines were cleaned up and the modems were made fully functional, according to Frost. The tellers were able to better communicate with the mainframes.

"In the longer term, as we look at the deployment of OS/2 LANs, we have an intelligent device — the CAP — in the branch capable of connecting LAN and SDLC equipment through modem, high-speed digital communications," Chislett said. "If we didn't have this structure, we would be thinking how to migrate to this technology."

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Kimball Brown

Preseason for handhelds

Watching the handheld market during the past year has been a little hit like watching your favorite football team suffer through a season without its starting quarterback and oo decent backup.

We all know the story: in August 1993, John Sculley, then Apple's CEO, capped off nearly two years of hype by introducing the Newton MessagePad. Sculley promised the MessagePad would help people organize and communicate their personal and business information. Tremendous excitement quickly turned to disappointment and then disgust as it became clear that Apple had failed to deliver oo Sculley's promise.

Faulty infrastructure

Apple and other personal digital assistant (PDA) vendors can be blamed for over-hyping the market. But the heart of the problem then and now is an insufficient communications infrastructure in the U.S. (and the world for that matter). Inexpensive, ubiquitous, two-way wireless networks would allow handhelds to be far more than expensive calendars and Rolodexes.

During the summer, the FCC held a first-of-its-kind auction for narrowband spectrum that delivered the kick-start that handheld computers desperately need to keep from following Momenta, Go Corp. and Eo over the edge.

The FCC auctioned off 10 nationwide licenses that five companies will use to build two-way, nationwide paging networks. These companies paid as much as $80 million for each license. In total, the FCC garnered $617 million. Winners at the auction included McCaw Cellular Communications, Destineer (formerly the NWN division of Mtel), BellSouth Corp., Airtouch and Paging Network of Virginia. This month, another 1,000 personal communications services (PCS) oarrowband licenses for local and regional paging services are being auctioned off.

PCS narrowband will he very differeot from the "duopolistic" structnre of today's cellular phone market, which allows for only two competitors in each cell and results in fairly high snd-user costs. All of the narrowband service providers will use the same spectrum, are standardizing on the same protocols and will ose the same infrastructure equipment that Mtel developed with Motorola and Glenayre in winning the Pioneer's Preference for PCS narrowband last year.

Initially, each service provider will use different modems because of the slightly different frequencies each was allocated. During the next 18 months, however, the end user will be able to invest in one modem or pager, yet ehoose from several different service providers' networks and thus intensify competition. This competition, coupled with lower infrastructure costs, should result in a broad array of services and very low-cost, two-way, wireless communications once the networks are built and the competition really starts. We estimate $20 to $30 per month of unlimited usage for local service and $60 to $80 for nationwide service.

Destineer, which has a six-month head start, expects to have nationwide service available commercially in the second half of 1995. The others should follow in 1996.

Start of something big

With this spectrum, users will be able to send and receive up to 2,000 characters of data (about a page of text) or receive volce mail. Microsoft Mail (Microsoft has invested $10 million in Destineer) or CC:Mail should be available by 1996 oo these networks. The vast majority of E-mail messages are less than a page long. Furthermore, the first design requirement of Mtel's network was that the device be able to run for at least 30 days on AA batteries.

With such a low-cost network that allows the use of such low-powered devices, the promise of handheld computers sendingand receiving E-mail anywhere in the country will be a reality in 1996 and should push handhelds into the mainstream, horizontal computer market by 1997.

It is still the preseason for handhelds and PDAs. Vendors are trying to piece together the right feature sets and form factors, and the eventual winners will come up with the right products in time for the networks to make them compelling. Like all great football teams, the devices need a catalyst, a leader that can come in and unify the team For handhelds, the catalyst is PCS narrowband, and the killer app is E-mail anywhere, anytime that every man can afford.

Brown is vice president of mobile computing at Dataquest, Inc. in San Jose, Calif.

Tribe Computer Works has introduced TribeLink, a cross-platform remote networking server.

According to the Alameda, Calif., firm, TribeLink lets remote Macintosh, PC and Unix users have eight ports of high-speed access to AppleTalk and TCP/IP oetworks over standard phone lines.

Features include security, filtering to hide zones from users, Simple Network Management Protocol management and the ability to nse existing modems.

TribeLink costs $1,995 and comes with LinkTracker management software.

▶ *Tribe Computer Works*
(510) 814-3900

Wandel & Goltermano, Inc. has announced the IDMS-30tF FDDI Ring Monitor, an independent Fiber Distributed Data interface (FDDI) ring monitor for Simple Network Management Protocol (SNMP) management.

According to the Morrisville, N.C., company, the IDMS-30tF FDDI Ring Monitor monitors every device on the ring and provides a comprehensive picture of the quality of service available on the ring.

The product leverages each FDDI node's self-monitoring functions, actively polls all FDDI stations on the ring, retrieves anomalous values, consolidates reports and communicates results via SNMP to a ceotral management station.

The IDMS-30tF FDDI Ring Monitor costs $14,500.

▶ *Wandel & Goltermann*
(910) 460-3300

FTP Software, Inc. has announced LANWatch 4.0, a software-based network analyzer.

According to the North Andover, Mass., firm, LANWatch 4.0 captures and displays all network traffic, letting users troubleshoot problems, monitor network usage and gather statistics.

New features include a mouse-driven interface with pull-down meous, support for SNA and Novell, Inc. NetWare protocols, the ability to save and import statistics to spreadsheets and search filters to search queues for error packets.

LANWatch 4.0 costs $1,200.

▶ *FTP Software*
(508) 685-4000

E-Comms, Inc. has announced E-Commander, a hardware/software system that provides real-time monitoring and control of a variety of remote LAN and WAN hardware devices.

According to the Gig Harbor, Wash., company, E-Commandsr reduces downtime and speeds up problem correction by providing power cycling, resource sharing, monitoring and device control.

The Control module acts as the single Ethernet connection point for other modules including: E-Power, which cycles power to remote hubs, server or ronters; E-Cat-5, which individually switches up to 12 RJ-45 data circuits to one common port; and E-Data, which individually switches up to seven RS-232 ports to a common RS-232 port.

Prices range from $1,095 to $3,500.

▶ *E-Comms*
(206) 857-3399

Product short

SQN, Inc. has announced Autofeed II, a fully automated signature capture system, and Signer Confidence, a signature recognition system. Autofeed II lets banks and processing houses eliminate hand scanning, manual cropping and manual account number eotry by automatically capturing the signature into an electronic file. Signer Confidence inspects checks automatically, makes pay/no pay determinations and batches questionable transactions on screen for operator approval. Cost: Autofeed II starts at $5,000; Signature Confidence starts at $12,500. SQN, Rancocas, N.J. (609) 261-5500

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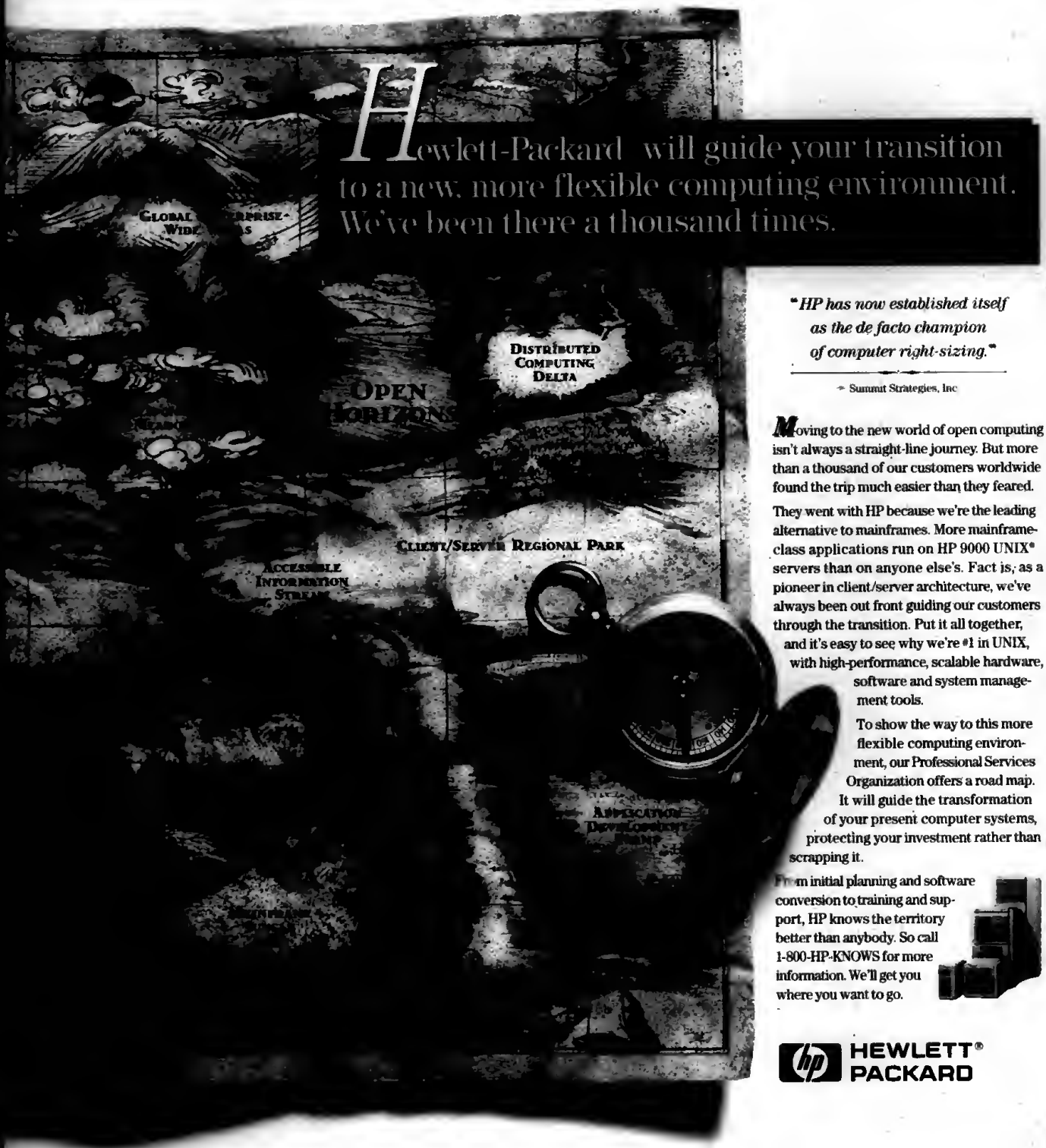

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Popular Himalaya gives Tandem new options, markets

By Jean S. Bozman

■ Tandem Computers, Inc.'s RISC-based NonStop Himalaya servers, which have shipped for a year now, are finding homes as cost-effective upgrades from aging Tandem Cyclone and VLX systems, users reported.

The machines are also allowing Tandem to break into new market niches, including those for decision-support database servers and parallel processors, industry analysts said. At the same time, they added, Tandem's architecture remains mostly proprietary and uses gateways and interfaces to open systems.

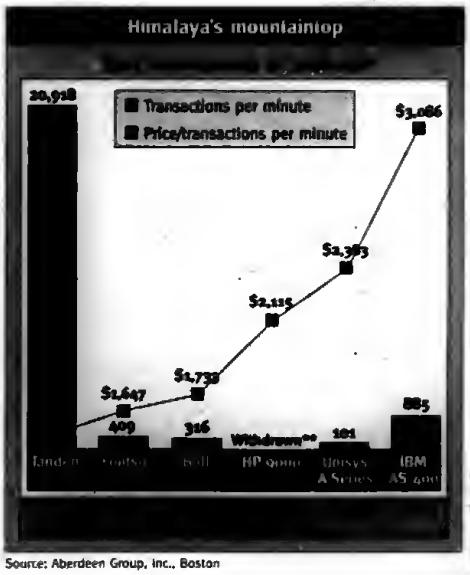
Revco, Inc., a 2,000-store pharmacy retail chain based in Twinsburg, Ohio, has used a high-end K10000 Himalaya system since the spring to support its national prescription-filling service. Its price/performance has far outstripped that of the Cyclone systems it replaced, said Ed Gropp, senior vice president of MIS at Revco. "We can process about twice as many stores per system on the Himalayas as we could on the Cyclone," Gropp said.

Expandability was another reason to install Himalaya processors, users said. Since the initial installation, Revco went from 10 to 16 CPUs, Gropp said, but the move created minimal downtime. "It's transparent to any of the end-user groups," he said. "You don't have to bring the system down." However, there are brief downtimes for occasional overnight maintenance.

Diagnostek, Inc. in Albuquerque, N.M., upgraded from Tandem VLX fault-tolerant machines to a K10000 system. "We replaced 10 VLX CPUs with four Himalayas, and we increased our capacity," said Linda Fihrer, vice president of MIS at Diagnostek. The firm processes prescription drug claims for large health insurance organizations through its use of Tandem's NonStop SQL relational database.

Others are using Himalaya for brand-new applications,

Himalaya, *page 62*



Source: Aberdeen Group, Inc., Boston

Early users warm to Iceberg

Customers like speedy I/O times

By Craig Stedman

While the rollout of Storage Technology Corp.'s long-chilled Iceberg 9200 mainframe disk array is being watched closely for any signs of a meltdown, four early users of the redundant arrays of inexpensive disks (RAID) device said it is standing up to intense scrutiny at their shops.

Analysts said they want to see more customers using Iceberg in heavy production mode before they give a seal of approval to the array, the first subsystem at RAID Level 5 or above to ship for mainframes. Potential buyers are under nondisclosure agreements while they evaluate Iceberg, so solid information is not yet available from a large sample of users, the analysts said.

However, some of the initial customers who have signed on the dotted line with StorageTek said the array is living up to its advance notices in a relatively trouble-free way. Iceberg is more than holding its own in production usage, with net capacity loads of as much as 75%, according to the users.

More in store

Three other StorageTek disk products are due to ship this year, starting this week with the mixed-host Nordique array

PRODUCT	DESCRIPTION	AVAILABILITY
Nordique	RAID Level 5 array for MVS and Unix hosts	Now up to 120G bytes; 272G bytes by end of year
[illegible]	[illegible]	[illegible]
Arctic Fox	High-speed external disks, 500M to 4G bytes	End of year

Flying along

Beech Aircraft Corp. ran into various microcode problems earlier in the year while Iceberg was in the final stages of its extended development, said Larry Duntz, assistant manager of computer services at the Wichita, Kan., company. But once StorageTek shipped a general-availability release of the microcode in June, he said, "everything just smoothed out."

Beech Aircraft's *Larry Duntz: Iceberg puts 3380s 'off for good'*

Becoming comfortable with Iceberg takes some time because of advanced features such as data compression and the ability to write data updates to any available spot on a disk drive, Duntz said. But Beech is now seeing average I/O response times under 10 msec, a third of the time it took to get data out of its StorageTek 3380-class devices, he noted.

The airplane maker is getting better than 3-to-1 data compression from its 100G-byte Iceberg array, and performance did not suffer as the capacity load was increased to 75%, Duntz said. He temporarily increased the load to 85% to test what would happen, "and we saw no impact there."

Beech installed a second Iceberg with a 200G-byte compressed capacity in July and decided late last month to buy that as well, a move that prompted Duntz to power down all of his 3380 drives. "They're off for good as far as I'm concerned," he said.

The Defense Information Systems Agency's data center in Richmond, Va., has not sailed as smoothly with its 200G-byte Iceberg. "But every incident that we've encountered has been corrected, and I just consider those to be normal occurrences on the whole," said administrator Bill Finefield.

The biggest problem came in early August when a memory board and one of Iceberg's processors failed at the same time, resulting in a bad track of data. The data had to be cleaned up using a tape backup, a process that took three hours to complete, Finefield said.

However, StorageTek supplied a microcode fix within 48 hours, and Iceberg "sailed right through" a similar failure a few days later, he added. Other hardware problems have cropped up, but Iceberg's redundancy lets users "replace [parts] on the fly and keep going."

The Richmond facility, which will be shut down late next year due to defense cutbacks, is running its Iceberg at 70% capacity with data compression of almost 3-to-1, according to Finefield. "If we weren't scheduled to close, I'd be ordering up more," he said.

Tom Loane, vice president of computers and communications services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., said his 200G-byte Iceberg is averaging about 20% faster performance than IBM's 3390 Model 3 subsystems combined with a 3990 Model 6 controller.

The increased speed is most noticeable on write-intensive applications, Loane noted. Meanwhile, Alamo has encountered "zero problems" with Iceberg since starting production work with it in early August, he added.

"We have not been able to make it break despite our best efforts," Loane said. "I wish it was [available] a year earlier, but that's beside the point now. I guess I have to give [StorageTek] credit for holding it back until it was ready to ship."

Ice ahead

Users will see a little more Iceberg on their radar screens later this year. StorageTek plans to double the array's disk capacity to 400G bytes in October and will do the same with the amount of available cache, which will increase to 16 byte. Later in the fourth quarter, Iceberg's channel capacity will increase from 16 to 32, the company said.

Another satisfied user is Tom Birk, operations manager at the Environmental Protection Agency's data center in Raleigh, N.C. The 200G-byte Iceberg array he bought is running 25% faster than the facility's 3380-class drives, and there have been no problems "of any consequence," Birk said.

Gary Helmig, an analyst at SoundView Financial Group in Stamford, Conn., agreed that the Iceberg users he has talked to report only "nagging, to-be-expected kinds of problems." However, he added that testimonials remain in short supply, partly because Iceberg sales have been "more modest than what some had expected."

Himalaya

CONTINUED FROM PAGE 61

among them a retail chain called Pick 'n Pay Ltd. in Cape Town, South Africa, and Target Stores in Minneapolis, which runs decision-support applications, analysts said.

Tandem's uptick in financial results this year was boosted by strong Himalaya shipments, said Stephen Josselyn, manager of systems market research at International Data Corp. in Framingham, Mass. Josselyn said $2 billion Tandem shipped three times as many Himalaya CPUs in its third quarter, which ended in June, as Cyclone CPUs in the same period one year ago. Tandem also held on to the lion's share of its traditional fault-tolerant market, with 77% market share, Josselyn said. Himalayas cost from $98,950 to $2.1 million.

The Himalaya is also a new way for Tandem, which built its business on fault-tolerant computers, to break into new market areas, industry analysts said. "They're starting to get new customers, so it's not just an upgrade for the existing NonStop customers," said Howard Richmond, vice president of high-performance computing at Gartner Group, Inc. in Stamford, Conn.

One of the new market areas is decision support, where Tandem's NonStop SQL relational database acts as a server for PC client SQL queries. Another focuses on using the Himalaya as a massively parallel processor that can create large data repositories of a half terabyte or more — or handle large numbers of data transactions simultaneously.

But analysts acknowledged that Tandem's NonStop architecture, which is optimized to be fault tolerant and highly scalable for large applications, is still proprietary. Even though Tandem has had a client/server strategy for more than two years, the NonStop operating system is an architecturally closed system that can be tapped by such client/server query tools as Powersoft Corp.'s PowerBuilder, analysts said.

New interfaces — including database gateways, ANSI 92 SQL queries and a new Posix interface for Unix users — are helping to break down the NonStop system's architectural isolation. And analysts said Tandem intends to build more openness into future systems.

"They're trying to change their stripes," said Peter Kastner, a vice president at Aberdeen Group in Boston. "They are trying to give people more bang for the buck, and they're more open than they ever have been."

Briefs

D&B upgrades Stream

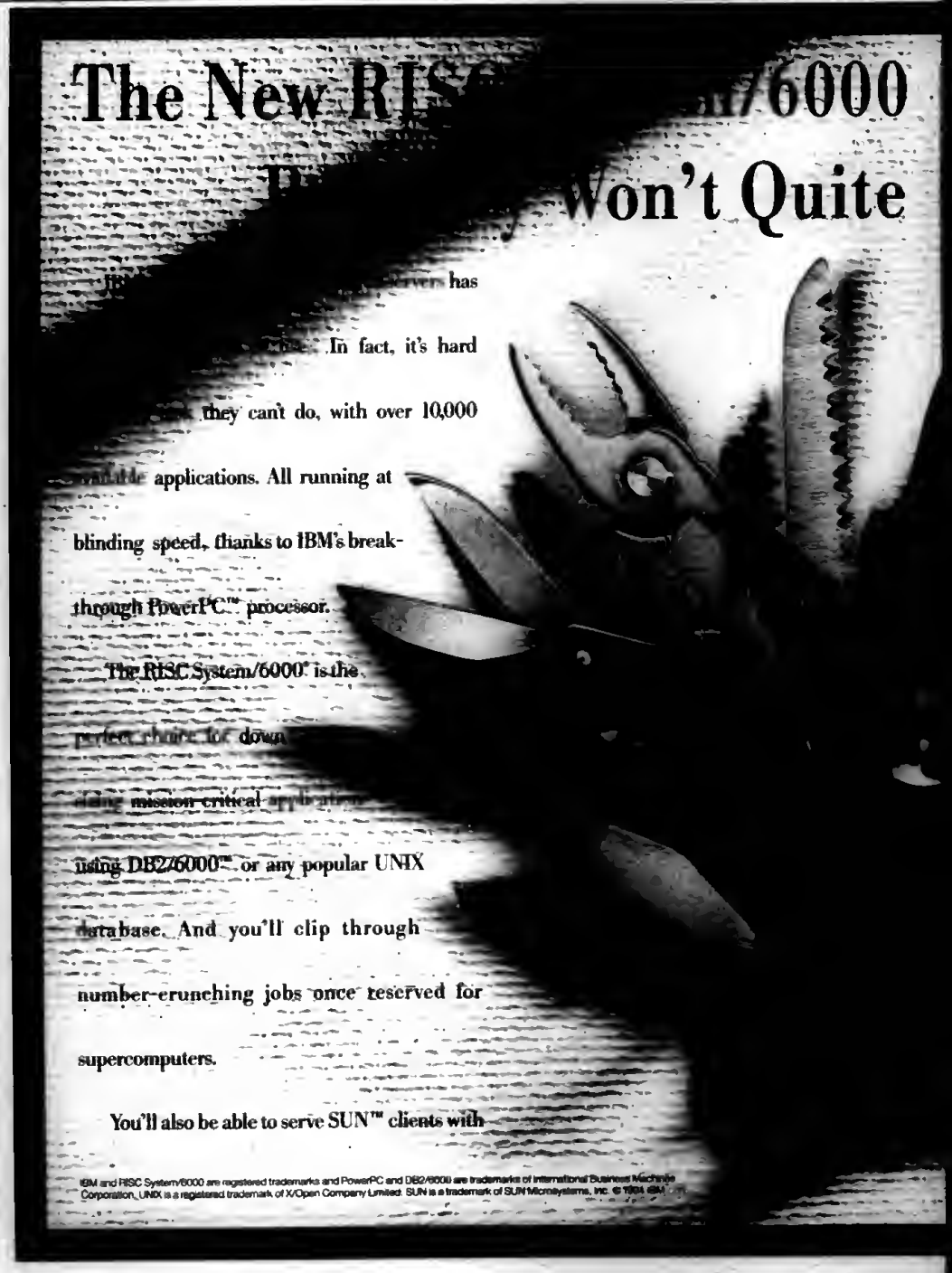
Dun & Bradstreet Software last week began shipping an upgraded version of its client/server financial software, Financial Stream, that includes additional data analysis functions. It also increased the number of payment mechanisms the software supports. D&B plans to follow this release with Version 3.0 in November. One analyst said the steady pace of upgrades is intended to create momentum for the product. Financial Stream, which began shipping last year, has about 55 customers.

Hawaiian center opens

The Maui High Performance Computing Center has officially opened on the Hawaiian island of Maui. An IBM Powerparallel RISC system is its central supercomputer. Run by the University of New Mexico and the Air Force's Phillips Laboratory at Kirtland Air Force Base in New Mexico, the center has been operating in test mode since last December. The facility has an 80-node Powerparallel machine supporting 350 researchers now. It plans to upgrade to 400 processors by the end of the year.

MVS integration added

Boole & Babbage, Inc. plans to add a module supporting integration with MVS mainframes to its Unix-based Command/Post systems management and automation software at NetWorld/Interop.



[redacted]

System Software Associates, Inc. has announced BPCS/AS 5.0, enterprise software for IBM RS/6000 Unix servers.

According to the Chicago. firm, BPCS/AS 5.0 includes Inventory Management, Purchasing, Cost Accounting, Advanced Process Industries, Manufacturing Data Managemeot, Shop Floor Control and General Ledger modules.

BPCS/AS 5.0 supports Informix Software, Inc.'s On-Line relational database.

Prices start at $1,875.

▶ *System Software Associates*
(312) 641-2900

Information Builders, Inc. has announced Eoterprise Data Access (EDA)/SQL Relational Gateway Server, software for IBM AS/400.

According to the New York company, EDA/SQL Relational Gateway Server provides transparent SQL-based access to relational and nonrelational data stored on an AS/400 database.

Users on PCs, workstations, midrange processors and mainframes can send SQL requests to EDA/SQL servers for processing against heterogeoeoos data oo the AS/400.

Prices range from $4,700 to $79,000.

▶ *Information Builders*
(212) 736-4433

Platinum Technology, Inc. has introduced Data Navigator and Compile/PRF, tools for IBM's DB2.

According to the Oakbrook Terrace, Ill., company, Data Navigator automates the migration of complete sets of DB2 data. Compile/PRF works with Platinum's Report Facility to execute DB2 database reports.

Data Navigator provides user-defined referential integrity (RI) rules, data sampling techniques and high-speed restartable data migrations that keep RI intact.

Prices start at $20,873 for Data Navigator and $18,216 for Compile/PRF.

▶ *Platinum Technology*
(708) 620-5000

KCI Computing, Inc. has announced Control/Excel and Control/Lotus, budgeting, forecasting and reporting software for Unix and mainframes.

According to the El Segundo, Calif., company, Control/Excel and Control/Lotus use Microsoft Corp. and Lotus Developmeot Corp. spreadsheet packages as their froni ends and act as a spreadsheet financial database server and an application middleware engine.

The products have a multiplatform architecture and run with nonproprietary relational databases.

Prices range from $400 to $4,000.

▶ *KCI Computing*
(310) 643-9222

Altai Software has announced Z/Team Unix and Z/Team 400, enterprise systems management products.

According to the Arlington, Texas, company, the prodncts let users define, submit and track job status and events throughout the enterprise regardless of platform.

Z/Team Unix for Unix environments and Z Team/400 for mainframes let users open a problem in a help desk, send messages to alert staff of problems and schedule backups and data transfers. Events executed in the Unix environment can trigger subsequent processing on the mainframe or vice versa.

Prices for Z/Team Unix range from $2,000 to $15,000; prices for Z/Team 400 range from $2,000 to $19,000.

▶ *Altai Software*
(817) 649-1816

Product shorts

Computer Site Technologies has introduced ResponseWare, a multivendor power managemeot product. ResponseWare monitors the power, environment and server with user-configurable alarm threshold settings. Alarms can be paged to users or to Computer Site Technologies' 24-hour response center. Cost: $99 to $1,750. Computer Site Technologies, Concord, Calif. (510) 676-8600.... **Sterling Software, Inc.** has introduced SAMS: Save for OS/2 5.0, storage management software. The product automatically reviews systems, recommends the appropriate backup level and backs up and restores PC hard disks. It also supports extended attributes and works in the background. Cost: $295. Sterling Software, Dallas, Texas (916) 635-5535.

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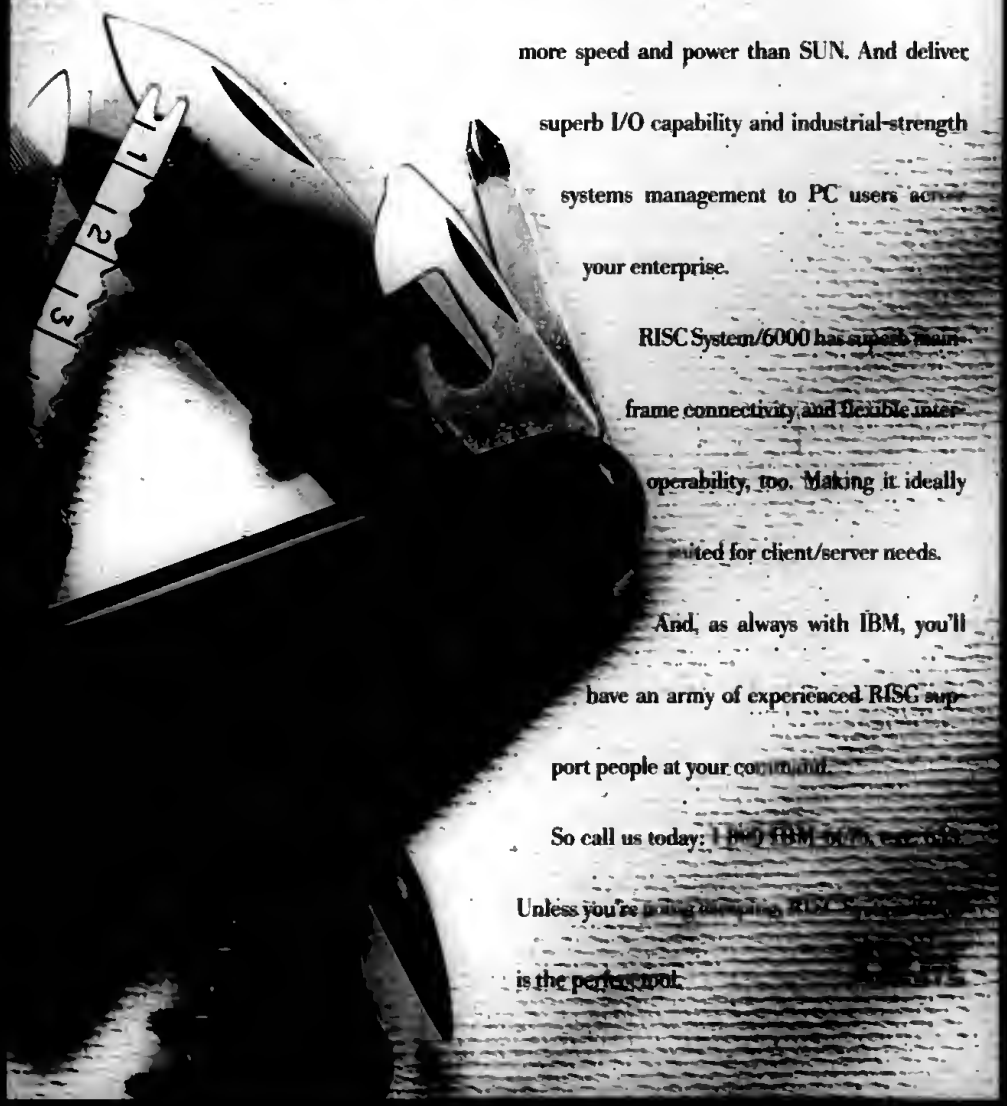

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JC Penney warehouses do away with paper

Electronic stocking enhances accuracy, cuts costs

By Mark Halper

The days of pencils and clipboards are numbered in JC Penney Co.'s warehouses.

Using one of the smaller trappings of today's distributed computing world — handheld scanners — and Hewlett-Packard Co. Unix minicomputers, JC Penney claims to be racking up savings by keeping close tabs on the consumer goods that combined fill about 3.3 million sq. ft. at three U.S. warehouses.

By coding goods as they arrive and electronically noting where they are stored and when they are shipped, the nation's fourth-largest retailer has become more nimble. JC Penney now stores newly arrived shipments more efficiently and can find them easily when it is time to ship them to some 1,200 retail stores and six catalog centers.

Steve Hawley, manager of the company's Buena Park, Calif., warehouse, claimed the system has yielded a 23% improvement in accuracy and enhanced productivity.

"What you need is subsecond response time so that as you're loading off a truck onto a pallet, the system can direct the forklift operator where to go store the merchandise," said Tony Pellegrini, a JC Penney informatinn systems development manager. He helped implement the systems now in place at the company's largest warehouse in Buena Park and at smaller facilities in Statesville, N.C., and Dallas.

At Buena Park, where many of the goods are from Asian suppliers, the barcode system is especially helpful to wnrkers sorting cartons to ascertain their exact conteots, said Ed Weller, a retail industry analyst at Robertson Stephens in San Francisco.

"It can save a lot of checking time and restocking time," Weller said. "When you have an easier time finding things, the capacity of your warehouse grows from 'X' number of dollars to 'X plus.'"

In fashion

Scanning has become a popular technology in many consumer goods warehouses. McKesson Corp., for instance, uses a scanning system deployed by its outsourcer, Electronic Data Systems Corp. And JC Penney's largest direct competitor, Kmart Corp., scans informatinn into HP minicomputers and IBM AS/400s, according to Gary Galunas, a Kmart systems manager.

Pellegrini recalled that prior to installing the HP-based system last June, counting and storing boxes was very much an old-fashioned procedure at the three warehouses.

"We did data entry off of paper documents onto the host," he said.

For JC Penney's Buena Park warehouse, the "host" was a group of Amdahl Corp. mainframes based in Reno, Nev., ooe of four JC Penney data centers. JC Penney still shuttles infnrmatinn between the warehouse and Reno via T1 connections.

In fact, orders come into the warehouse from Reno, which houses a corporate ordering system. Similarly, a Dallas data center alerts the Dallas warehouse nf orders, and a Columbus, Ohio, data center sends nrders to the Statesville warehouse, according to Pellegrini.

The warehouse operations are supported nn the HP 9000s running Oracle Corp. databases and distribution management software provided by McHugh, Freeman and Associates, Inc. Warehouse workers eoter information with a combinatinn of rsdio connections using scanners from Symbol Technology, Inc. and wired connections nsing scanners from Accu-Sort and Laser Data, Inc.

Pellegrini said JC Penney considered implementing direct links to the mainframes, "hut we just thought we would get better service and quicker response time on a local processor."

Decisions, decisions

Bob Korb, systems service manager at Buena Park, said the company faced a number of component choices when it first designed the system. Among them, he said, was whether to use Symbol's handheld scanners or its strap-on "gladiator-style" scanners.

JC Penney opted for the handheld scanners because, among other reasons, it was coocerned that warehouse workers needed two hands to lift large boxes and that they faced a greater chance of incurring repetitive-stress injuries with the strap-on units, Korb said.

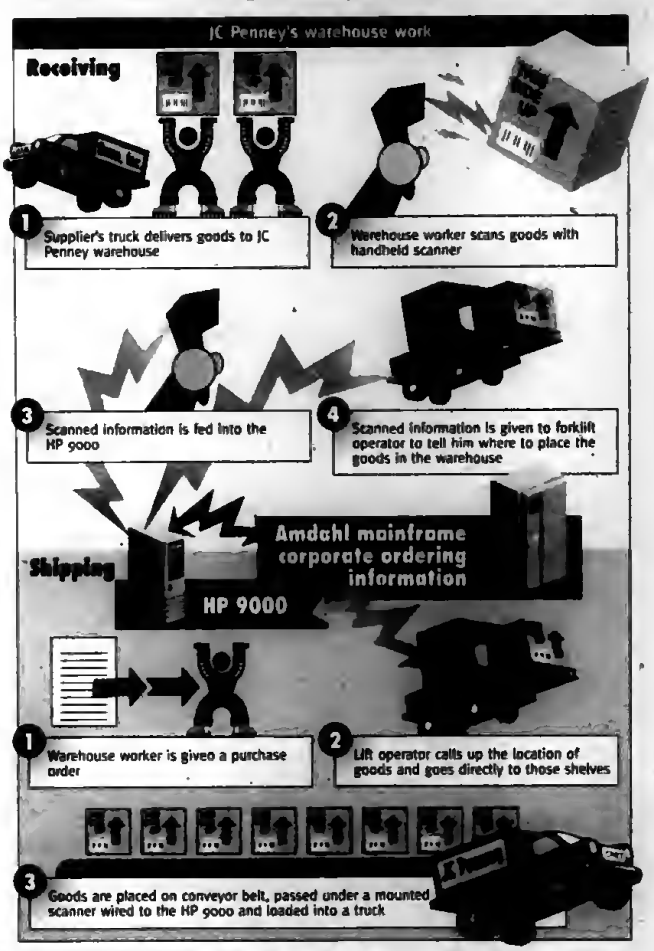
The company also had to choose between radio-transmissioo scanners and wired scanners. It decided to use Symbol's radio scanners for receiving and stocking goods. But for "picking" goods to fill orders, the company uses Accu-Sort's and Laser Data's wired scanners mnunted above conveyor belts.

"We didn't see where radio frequency would give us more productivity on picking," said Korb, who explained that order fulfillment involves more manual work than replenishment because workers are doing tasks such as affixing labels.

Radio transmission is routed to the HP 9000 through a Token Ring network via Connect, Inc. network cootrollers. Wired information goes through a Chipcom Corp. huh via Ethernet to the 9000, Korb said.

Hawley said the system will eventually eliminate costly twice-a-year warehouse shutdowns when JC Penney counts inventory.

"Soon we won't need to perform those physical inventories because our new system operates in real time and reflects up-to-the-minute accuracy," he said.



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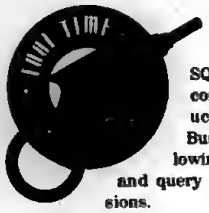
Micro Focus gives Burl's Revolve a boost

By Tim Ouellette

When Al Lilly heard that Burl Software Laboratories was being purchased by Micro Focus, Inc., he canceled his order for a competitor's visual analysis tool. The merger of the two vendors, both of whose wares he uses, made all the difference, said Lilly, a programming manager at Ziric Canada in Toronto.

Raleigh, N.C.-based Burl has an analysis package called Revolve, which Micro Focus is now adding to its Cobol Workbench development environment. Micro Focus will continue to sell Revolve as a stand-alone product as well.

Revolve 2.0 examines and inventories Cobol applications. It also provides improved parsing capabilities and includes all major dialects of Cobol, JCL, SQL, DB2, BMS, IMS and CICS, according to the company. The product's database engine, created by Burl, has also been enhanced, allowing users to examine, visualize and query faster than with previous versions.



"Some environments can't even tell you how many programs are in the system or the total lines of code. This tool is the only way to even get a handle on impact analysis if you have to go in and make changes real quick," said Robert Richardson, a software engineer at The Franklin, a Springfield, Ill., insurance firm.

"I consider Revolve profitable," Lilly said. "Within five minutes of using Revolve, we got our money back. The time it takes to impact a field across a hundred programs is a lot of hunting and pecking on the mainframe, while it only takes an hour or two now."

Interesting integration

But the real change with Version 2.0, according to analyst Kevin Schick at Gartner Group, Inc., is that Revolve is now part of the Micro Focus product offering.

"Version 2.0 is virtually the same product. There is not really any significant capability that wasn't there before," he said. "What is more interesting is the move toward integration" with Cobol Workbench.

Lilly, a longtime Revolve user, also values its contribution to the insurance company's restructuring effort.

"As people move, you lose your knowledge base, ending up with a bunch of systems few people know about," he said. "You still have to run them, though, and Revolve is the first thing I go to if someone comes to me with a question about a possible change."

Schick said Revolve provides a static snapshot of an environment downloaded to a workstation from the mainframe. "As more and more organizations go to an off-loaded environment, it will be very important," he said.

Revolve 2.0 costs $2,500 or $1,500 for users of Micro Focus Cobol Workbench.

As time goes by

Kevin Schick, an analyst at Gartner Group, and users of Revolve said the product will help companies handle the date routine problems when the year 2000 rolls around. Another firm, Adpac Corp. in San Francisco, has introduced SystemVision Year 2000, a mainframe analysis tool that estimates the scope and cost of date conversion.

Client/server

High-end tools gain steam

Vendors set to release variety of robust development suites

By Melinda-Carol Ballou

Summer is ending with a crop of tools to help customers develop high-end client/server applications.

Corporate developers are moving beyond creating decision-support and pilot client/server applications to developing and deploying complicated mission-critical applications, according to Peter Kastner, vice president at Aberdeen Group, a Boston-based consulting firm.

To support them, a number of vendors — including Dynasty Technologies, Inc., Bachman Technologies, Inc., Forte, Inc. and Seer Technologies, Inc. — recently released products or new versions of their tools or will do so within a few weeks.

For its part, Bachman began shipping Ellipse last month as expected. Ellipse was originally from Cooperative Solutions, Inc., which Bachman acquired last year.

On the more client-focused side, Powersoft Corp. will release PowerBuilder 4.0, which is expected to improve performance and transaction services.

More options

In addition to meeting an emerging market need, vendors are providing these options to avoid a low-end market that is becoming increasingly commoditized. The margins for low-end tools are almost nonexistent due to pricing pressure from companies such as Microsoft Corp. and Gupta Corp. Gupta began distributing a desktop version of its tools for free earlier this summer.

"This is not your 20-user workgroup problem. Dynasty, Seer, Forte, along with many other industry players are heading upscale into enterprise client/server both to meet market demand and to avoid the bottom-clearing juggernaut that is Microsoft's tools division," Kastner said.

For instance, late last month Dynasty announced Version 2.0 of its Dynasty tools. The product generates code for multiple platforms and relational databases and lets users graphically partition applications across multiple clients and servers. Version 2.0 addresses users' security concerns with support for the Open Software Foundation's Distributed Computing Environment. It also sports performance improvements and the ability to reuse code more easily, Dynasty said.

Several developers said Dynasty gives them a powerful option for creating upscale, transaction-intensive client/server applications. Among its benefits, they cited the fact that developers can use standard C language rather than a proprietary fourth-generation language.

Joe Rosenberger, a technical specialist at Sprint Corp. in Overland Park, Kan., said the company took one of "the most complex transactions we had to build in our application and essentially prototyped it in Dynasty." Rosenberger said he particularly liked the way Dynasty handled the transactions between the physical database and the application via a data manager object or base class.

Several benefits

This approach allowed easier management and control of transaction processes, better performance and the ability to more easily reuse code in a variety of situations, Rosenberger said. "It handles all the transactions between the data layer and the presentation layer," he added.

Wells Fargo Bank in San Francisco used Dynasty to create a pilot customer cross-reference application that will be distributed across four versions of Unix and Windows, according to Fima Katz, systems architect at the bank. The application will ultimately target approximately 700 bank branches with four or five tellers at each branch — as many as 3,000 tellers.

Katz's group decided to use the Dynasty tools for performance purposes because they could target multiple platforms using standard C. The application is not yet in production.

But Dynasty is "not for the meek," said Sybil Ege, director of health information products at Resource Information Management Systems, Inc., a Naperville, Ill.-based provider of claims benefit payment software for insurance companies. "This is a professional tool and not something that someone would play with over the weekend. It's not totally intuitive," she said. The new version improves usability, but training is definitely required, Ege added.

But these early users are primarily at the pilot stage. Developers must exercise caution before jumping on the high-end client/server bandwagon, analysts said. "You need highly tuned database server drivers for transaction-intensive applications," said Rich Finkelstein, president of Performance Computing. "How many times have we been burned when we just took someone's word for it? The proof is in deployed high-end applications."

Tools on tap

Later this month, Forte is expected to announce the first release of its tools, which were originally expected this summer. Seer is expected to ship its repository on Unix and OS/2 to target this same market next month.

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Muscle Beach 15%	● Hundreds of users ● 2 to 10 trans./sec. ● Needs database of 1G to 10G bytes	Line of business, large departmental systems
Fun World 84%	● Less than 50 users ● Less than 2 trans./sec. ● Needs database of less than 1G byte	Small departmental systems, workgroups

Source: Forrester Research, Inc., Cambridge, Mass.

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George McQuilken

IBM bases future on objects

IBM's plans for object-based application development tools show the Big Blue Engine That Could chugging toward an end-user programming strategy that promises to change the way software is developed, purchased, delivered, installed and maintained. But the hill it must climb is the industry's memory of A/D Cycle Approach, which soars high above PL/1 as IBM's greatest blunder in programming direction.

IBM's new strategy, anticipated principally in directional announcements, combines a visual development approach with new IBM-supplied object-oriented language implementations. And for shops that choose to stay with the procedural paradigm, IBM intends to provide alternative visual tools combined with a LAN-resident object-based program repository.

The tool of choice for future development will be based on VisualAge and VisualGen. To supplement this tool, IBM intends to get back into the compiler business in a big way with C++, object-oriented Cobol and perhaps even object-oriented PL/1. Also coming are Smalltalk, object-oriented REX, Visual RPG and Microsoft's Visual Basic. IBM intends to deliver fully compatible versions of most compilers across all its strategic systems, which now include OS/2, AIX, OS/400 and MVS. And according to Steve Mills, general manager of IBM's Software Solutions Division, IBM will also sell these compilers for competitive platforms.

> Vendors of competitive programming languages and tools will be forced to race IBM to the crossing, securing user commitment before IBM's products are ready.

Two for one

This source code approach will undoubtedly please users while breathing new life into Cobol. IBM prefers to deliver code in binary form, and to continue on this path, it has defined the System Object Model (SOM). SOM is a system facility that will be available for all IBM strategic operating systems. This will allow IBM to ship both systems and vertical application code as SOM objects — the same objects for all platforms.

IBM's new class libraries will also be SOM objects. And SOM, also available via IBM's new compilers, can be used in a distributed version for advanced client/server computing.

Questions linger

But key questions remain: Will users accept this new, as-yet-unnamed approach? How will it affect the industry?

Users stand to gain with this new strategy. They will be able to mix and match objects from IBM with objects they create themselves and/or objects bought from third-party vendors. It will now be possible to sell parts of applications in binary form — something that has very seldom been practiced, although it is theoretically possible. Through inheritance, users will be able to effectively modify vendor code. And applications will be maintained and updated, one SOM object at a time.

Vendors of competitive programming languages and tools will be forced to race IBM to the crossing, securing user commitment before IBM's products are ready. But most software companies will support IBM's approach, and competitors will be forced to adopt it as Sun, Apple and Hewlett-Packard already have.

Future applications

Can IBM deliver? IBM predicts that the new object technology will be used in many commercial applications by 1995 and will enter mainstream computing in 1996. But IBM is very large, and coordination between groups is difficult.

And at least IBM now acknowledges failure in the AD/Cycle debacle. Eric Bush, IBM's manager of enterprisewide A/D strategy, said everything in A/D Cycle was based on a central repository. And when the repository concept failed, the whole strategy fell. In this new strategy, the major focus is on the tools. It's a lot more concrete.

My prediction: IBM is back as a major force in the software development industry.

McQuilken, a former editor of *IBM Systems Journal*, is president of Demeter International in Marblehead, Mass., a provider of object-oriented programming tools.

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Blue Sky Software Corp. has announced WinMaker Pro 6.0, a prototyper and C/C++ code generator for Windows.

According to the San Diego company, WinMaker Pro 6.0 lets programmers visually design applications and attach functionality without writing a line of code.

The product includes a new Project Manager for editing all object resources, floating palettes for instant access to functionality and features and Switch-It code generation modules for generating ANSI C code.

WinMaker Pro 6.0 provides support for version control software and lets developers integrate multimedia into Windows applications.

WinMaker Pro 6.0 costs $495.

▶ *Blue Sky Software*
(619) 459-6365

Information Builders, Inc. has announced Level5 Object Professional, a workbench for developing components for client/server applications.

According to the New York firm, Level5 Object Professional lets users build and deploy intelligent software agents that can be embedded in other applications or run over a LAN and distributed across an organization.

The software agents transparently reside with applications and check data for compliance with pre-established conditions, act as a knowledge server and aid in decision-making. Add-on object libraries that come with the product let users use objects without programming.

Level5 Object Professional costs $2,995.

▶ *Information Builders*
(212) 736-4433

ACI US, Inc. has announced 4D Passport, a client/server connectivity product.

According to the Cupertino, Calif., company, 4D Passport connects ACI's 4th Dimension Macintosh environment to SQL databases.

The product provides a graphical, integrated front-end development environment and lets an unlimited number of users manipulate data.

A cross-referencing tool lets developers create code libraries, share code and generate documents. A reporting tool lets developers create ad hoc reports that calculate and display data in a custom format.

4D Passport costs $6,000.

▶ *ACI US*
(408) 252-4444

MicroHelp, Inc. has announced VBGraphix, a Visual Basic charting and drawing tool.

According to the Marietta, Ga., company, VBGraphix lets users create presentation-quality graphics in Microsoft Corp.'s Visual Basic.

Features include extensive drawing capabilities, incorporation of pictures directly into charts, creation of multiple charts on the same page, unlimited palettes, object manipulation and zoom capabilities.

VBGraphix costs $399.

▶ *MicroHelp*
(404) 516-0899

ParaSoft Corp. has announced Insight++ 2.0 for C++, an automatic runtime debugger.

According to the Pasadena, Calif., company, Insight++ 2.0 supports C++ programs, pinpoints bugs and provides information needed to repair a bug quickly.

Features include a validation tool that produces images of memory and data patterns and an InUse tool that displays statistics on how the program allocates and frees memory while it runs. Its total coverage analysis capability reports on what sections of code have been tested.

Insight++ costs $1,495 for a three-user license.

▶ *ParaSoft*
(818) 792-9941

Looking Glass Software, Inc. has introduced MediaVerse, a multimedia authoring tool.

According to the Inglewood, Calif., company, MediaVerse is a Windows-based application that combines editing, database storage, interface design and playback.

The product has three components: Multimedia Database Builder for the design, organization, search and retrieval of media information; Interface Builder for directing the flow of media items to specific areas of the screen; and Play-Back Engine for playing back presentations with video, audio, hit-map graphics and a text engine.

MediaVerse costs $799.

▶ *Looking Glass Software*
(310) 348-8240

Product short

Subtle Software, Inc. has announced Subtleware 1.5, object-oriented development software for C++/SQL, C++/Open Database Connectivity, C++/Sybase, C++/Oracle and C++/Watcom. Subtleware 1.5 supports persistent pointers, persistent collections and ad hoc SQL queries to the underlying databases. Cost: Ranges from $400 to $999 for the PC or $4,500 to $7,500 for the Unix environment. Subtle Software, Billerica, Mass., (508) 663-5584.

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■ INSIDE
Intelligence files
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EASTERN EUROPE'S

Peter Alsberg

Five years after the fall of the Iron Curtain, Eastern Europe's telecommunications infrastructure remains a problem. But perseverance is helping U.S. firms muddle through until expected improvements arrive.

VIRTUAL CURTAIN

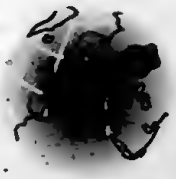
By Alice LaPlante

Early this year, Pepsico International began setting up a bottling facility in Katowice, a major city in southern Poland. Among the first items of business: the exhausting process of negotiating 50 telephone lines for the site.

Dave Douglas, vice president of information technology at Pepsico, expected to face red tape and bureaucratic stonewalling. But he didn't expect the phone lines to be the most arduous aspect of getting the factory up and running.

"It required daily diligence," Douglas says. This included trekking from one local ministry to another as well as completing reams of paperwork to acquire the permits for Pepsico employees to place long-distance and international calls. In Poland, getting a phone line installed does not automatically provide you with communications access outside your immediate area, much less outside the country.

Pepsico's experience is typical of U.S. companies trying to set up shop in Eastern Europe. Five years after the fall of communism in the former Soviet Bloc, the telecommunications infrastructure needed to fully develop this potential gold mine is still lacking. While the outlook is beginning to brighten, economic health has been slow in coming to the region.



At the end of 1992, Eastern Europe had installed just 15.65 telephone lines per 100 people, compared with more than 45 per 100 in Western Europe. Call failure rates were higher than 50%.

But there is renewed interest in Eastern European investments. U.S. firms expect that things are about to turn around. Economists are optimistic about real economic growth in the Czech Republic, Poland and Hungary during the next two years and that most of it will benefit Western companies setting up local operations or importing goods to the region.

"We're finally seeing the shift from a state-owned to consumer-driven market," Douglas says.

But U.S. companies will find they have to make a

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Virtual curtain

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big adjustment in the way they do business when they try to set up shop behind the former Iron Curtain.

"The biggest roadblock to a rapid expansion into Eastern European markets is a lack of a technology infrastructure — particularly telecommunications," Douglas says.

He has plenty of support for his views.

"Walk down the aisle of any business class flight to Prague or Moscow, and you can collect telecom horror stories from each and every passenger," says John Moroney, a senior consultant at London-based technology market research firm Ovum Ltd.

In search of investment

The telecommunications infrastructure in Eastern Europe needs as much as $94 billion invested over the next six years to bring standard phone service up to snuff. As of 1991, only $2.6 billion had been invested, according to the International Telecommunications Union (ITU), an international telecommunications consortium of vendors, government bodies and corporate users.

Investment activity by Western telecom giants has picked up considerably in recent years. AT&T Corp., Ameritech Corp. and US West have been putting hundreds of millions of dollars into technology and business ventures in the former Eastern Bloc, but it's still a long way from business-as-usual for U.S. firms.

"Not only is the infrastructure not there, but these countries have no notion of a service economy," says Iain Gillott, manager of wireless communications at Link Resources Corp., a market research firm in Framingham, Mass. "Don't expect to get a phone hooked up in a few days or even a month. Be prepared to be patient and flexible."

John Matthews, a principal consultant at Ovum, knows this from personal experience.

Matthews spent three months early this year in Budapest on a consulting contract with Hungarian Telecom. "When I first got there, I saw a memo stating they had a goal to get dial tone access time down to 10 seconds," Matthews recalls. "I assumed that was a misprint. I thought certainly they meant 10 milliseconds."

Wrong. And that's in Budapest, where modern signaling equipment has been installed. "In outlying cities, you can wait up to two minutes before you get a dial tone," he says.

Matthews remembers visiting a new General Motors Corp. plant in Hungary, near the Austrian border. Managers there were able to negotiate for decent telecom service with Hungarian Telecom due to the large local investment. Calling outside the region — to other major Hungarian cities or even internationally — was a fairly smooth operation. But GM found it couldn't communicate with a local supplier in a small town nearby.

"That supplier couldn't get telephone service," Matthews says. So GM had to dispatch a bicycle messenger when it needed to communicate with the supplier.

Colgate-Palmolive Co., the personal care products manufacturing giant, has had profitable operations in the former Eastern Bloc for almost three years. But communicating with remote offices has been difficult, to say the least, says Chris Coyle, director of information technology at Colgate's International Business Development Group in New York.

"It wouldn't be uncommon for me to be five minutes into an important phone call to Romania only to have the line drop," Coyle says. If lucky, Coyle says, he might be able to reestablish the call 30 or 60 minutes later. "And then you have to start over and repeat the first five minutes of the call."

Toiling over a hot fax

To get a feel for how managers cope with these problems, talk to Dick Sarvas.

Sarvas, program manager for Polaroid Corp.'s Moscow-based manufacturing operations — run under the auspices of Szetozor Ltd., of which Polaroid is two-thirds owner — has just agreed to pay $8,000 to install a private fiber-optic network between Polaroid's facilities and the local Moscow telecom switching station. The network will ensure that he has five "clean" digital phone lines. It's a high price tag for what Sarvas is praying will be passable communications capacity.

Until then, Sarvas' options for getting critical data from his office back to Polaroid's Boston headquarters are limited. And none of those options is pretty.

He can attempt to place a phone call, but there's an eight-hour time difference and it's difficult to get a line out of the country. It's not unusual for Sarvas to spend an hour redialing a number 40 or 50 times before an international call goes through. So he's rarely successful at catching a U.S.-based Polaroid executive at his desk.

Technology is a problem even for a technology company.

"When the [Berlin] Wall fell, good office space in the Eastern Bloc was extremely scarce," says Christian Wedell, Munich-based regional director for Microsoft Corp. in central Europe. "You took what you could get." That often meant businesses found themselves in older buildings without telecommunications access, he says.

Wedell has what he calls the "luxurious technology life" in Munich: "I'm fully connected to the Microsoft network, I directly access services in Redmond, and whatever I need I can get."

But employees in Microsoft's office in Budapest aren't nearly as lucky. They can send and receive electronic mail and file attachments, but that's about it, Wedell says.

"We could never hold the line long enough to send a complete message," he says.

CompuServe or the Internet are safer choices because SprintMail offers a Moscow connection to the CompuServe system as well as Internet Europe, Sarvas says.

Leapfrogging to cellular

When will Eastern Europe catch up? Not until 1997 or 1998, says Kathy Tito, an industry research analyst at market research firm Business Research Group in Newton, Mass.

"We're seeing a number of important telecom launches today, but it will take some time before these are stabilized and affordable," Tito says.

Other experts are more pessimistic. Ed Mattix, executive director of business development and communication at US West International, Inc. in London, predicts a wait of five to seven years before the telecommunications infra-

Virtual curtain, *page 79*

Slow crawl toward capitalism

Per capita dollar expenditures on all consumer goods in Eastern European countries are still behind those of Western Europe:

WESTERN EUROPE:	EXPENDITURE:
Luxembourg	$14,909
Germany	$14,568
France	$13,857
EASTERN EUROPE:	
Hungary	$1,896
Poland	$1,466
Czech and Slovak Republics	$849

Source: Eurostat/International Monetary Fund research

The list for telephone service in Hungary, a country where only 1.2 million phones have been installed, has more than 800,000 names on it; the wait can take 20 years. It's not uncommon for someone to die before they get a telephone.

— John Matthews, a principal consultant at Ovum

"Not only is the infrastructure not there, but these countries have no notion of a service economy. Don't expect to get a phone hooked up in a few days or even a month. Be prepared to be patient and flexible."

— Iain Gillott, manager of wireless communications at Link Resources

OPPORTUNITY KNOCKS

Among the six European countries that the European Commission describes as "emerging" are the Czech Republic, Hungary and Poland. What this means: opportunity.

No surprise that U.S. firms such as Pepsico, Gerber Foods, General Electric Co., Whirlpool Corp. and others have targeted the region for major expansion.

- Microsoft's revenue for Eastern European markets grew a whopping 170% during the past year.
- Polaroid depends on its Moscow-based manufacturing operations for more than one-third of its worldwide printed circuit board supply for its camera products. It realized a tenfold leap in revenue between 1992 and 1993.
- Pepsico is so enthusiastic about the market possibilities that it will have constructed more than a dozen distribution plants and bottling facilities in the Czech Republic, Hungary and Poland by the end of the year.

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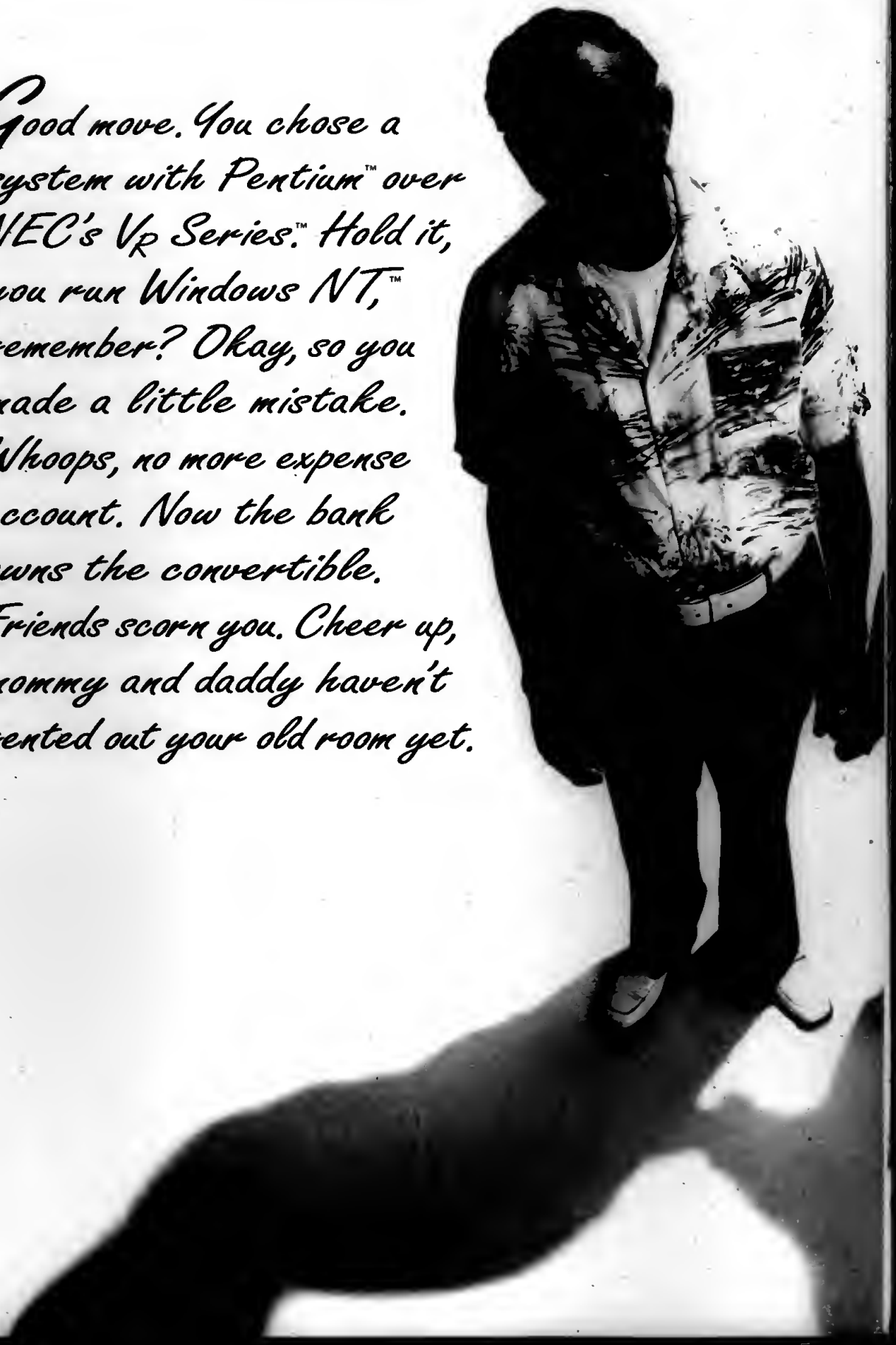

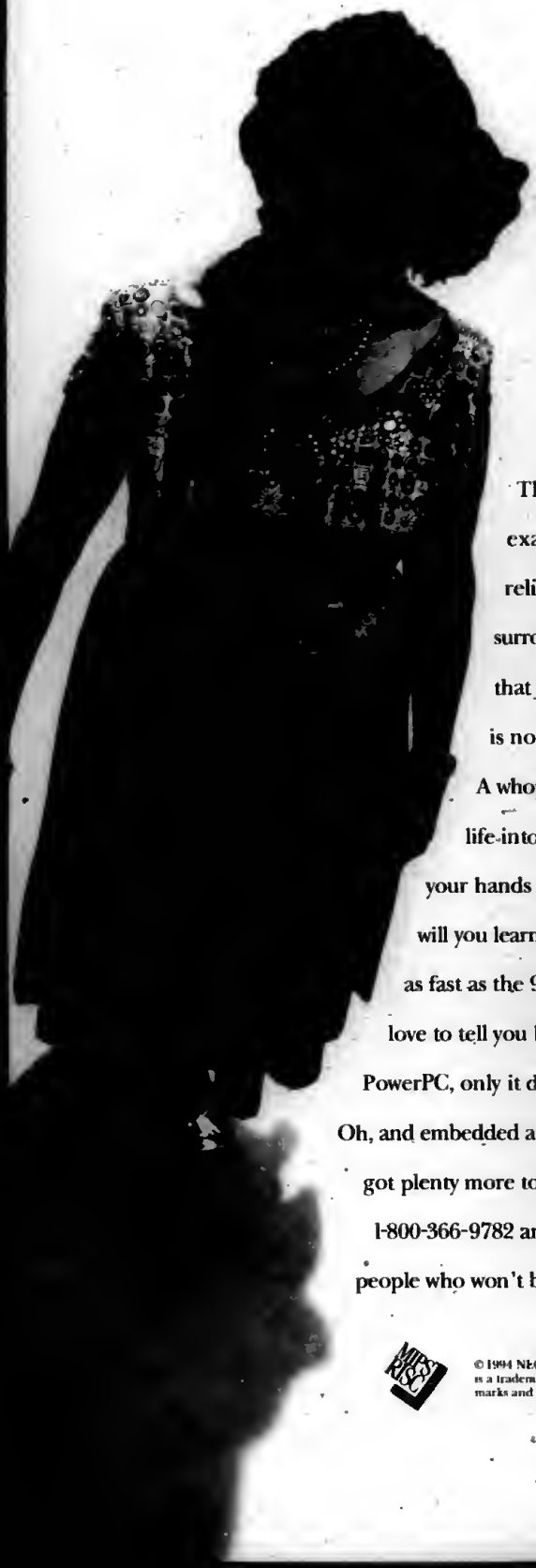

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THE SHORT OF CHOOSING A ROUTER AS TOLD BY PROTEON.

BOB FISHER

The investment leaders

Ten telecnmmunicatinns companies are the biggest players in Eastern Europe in terms of capital investments made or financial commitments

Deutsche Bundespost Telekom	Germany	$575 (for 1993-94)	15% share in Matav Hungarian Telecommunications Group (privatized in 1993).
Ameritech Corp.	U.S.	$485	Co-partner with Deutsche Telekom in Matav market.
AT&T Corp.	U.S.	$300	Setting up equipment joint ventures, mainly in Poland.
Siemens AG	Germany	$290	Main equipment supplier for Deutsche Telekom.
Alcatel-Alsthom SA	France	$258	Primarily for factories in Poland, Hungary and Slovakia.
Cable & Wireless PLC	Great Britain	$160	Cnmmitted tn eight ventures aimed at providing telecommunications services in Russia, Bulgaria and Latvia.
US West, Inc.	U.S.	$80	Has the world's largest portfolio of Eastern European cellular telephone licenses.
Telekom Finland	Finland	$78	Basic telecommunications services and cellular phone networks in the Baltic states.
France Telecom	France	$60	In partnership with Alcatel-Alsthom SA.
Telia AB	Sweden	$35	Basic telecommunications services and cellular phone nelwnrks in the Baltic states.

Source: Survey by the Central European Economic Review, Budapest

Virtual curtain

CONTINUED FROM PAGE 74

structure in Hungary, Czech Republic and Poland meets Western expectations of voice and data service. For other countries in the former Eastern Bloc, "this will take much longer," Mattix warns.

But things are improving. More telecom options are becoming available as Eastern European markets are privatized and Western vendors see the opportunities in the region.

Turning to cellular

Meanwhile, frustration with the land-based telecom options is causing U.S. firms to turn to cellular and satellite options faster in Eastern Europe than on their home turf, Tito says.

The pros of cellular or satellite service include the guarantee of 24-hour-a-day, high-quality access to "clean" data and voice lines. The drawback is these services are expensive. "You can get decent communications if you go with satellite," says Moroney at Ovum, "but you'll pay dearly for it."

Expensive or not, sometimes satellite pays for itself.

Colgate recently installed a private satellite network to connect manufacturing, distribution and marketing sites in the Czech Republic, Slovakia, Hungary, Romania, Poland and Russia with its headquarters in New York. The result is better transmission of voice and data with the former Warsaw Pact nations.

The up-front price quotes of a satellite system are so reasonable they might put an information technology manager into shock. Once you add up the lost productivity from limited overseas access, dropped lines and redialing time, "basically you get clean 24-hour access at very little extra cost," Coyle says. Add missed business opportunities and satellite technology makes absolute sense, Coyle says.

Land-based alternatives are also emerging. For example, Poland is in the middle of an ambitious project to install a fiber backbone network that will provide modern digital telecommunications services throughout the country. The backbone is expected to be completed in major population areas by 1997, but it will take much longer to get to smaller villages, many of which have no telephone service. At this point, only major cities are hooked up, Moroney says.

According to the U.S. Chamber of Commerce, usage of analog cellular systems increased by 245% in central and Eastern Europe last year, raising the number of subscribers in the area to nearly 100,000. That is expected to reach 350,000 by the end of 1996.

Still, perseverance pays off. Pepsico eventually got the lines it needed for the Katowice plant, even if it still has to hold off implementing its corporate strategy. That involves running mission-critical client/server applications between remote plants and warehouses in places like Katowice and Budapest, Prague and Warsaw.

Indeed, because of the difficulty of communicating with the U.S., many Western multinationals eventually make their Eastern European operations fairly autonomous, Moroney says.

"Initially, most companies try to run them from the West, but they gradually turn into locally run operations," Moroney says. "The difficulty of communicating back and forth usually forces this decision."

Technology regression

In short: You can go into Eastern Europe today, you can set up operations, and you can probably see a profit almost immediately. But be prepared to give up the technological conveniences you've come to depend on in the West.

Says Douglas: "Basically, you first have to figure out what is possible, then work backwards from there when setting up your [information technology] operations."

"Going into Eastern Europe is like going back 25 years. It's really primitive," agrees Edward M. Roche, a visiting associate professor at the Center for Information Technology and Management at the University of California at Berkeley.

Indeed, Roche stresses that U.S. businesses must take the crude telecommunications infrastructure into account when doing "location economics" for any Eastern European expansion.

"A failure to calculate how much time and money it's going to cost you to communicate — with either voice or data — could well determine whether your business model is going to work or not," he says. ■

LaPlante is a free-lance writer in Woodside, Calif.

ANSWERING THE CALL

Eastern Europe is seeing an increase in private networking services that offer viable options to local, state-owned Postal Telephone and Telegraph services. In some cases they reflect privatizations of former state-run services.

- Poland's North South Link is a 1,500-kilometer fiber-optic system completed in 1993. A joint venture of Telecom Denmark Ltd. and Great Northern Telegraph Co., the system cost approximately $31 million.
- Deutsche Telekom and Ameritech invested $875 million to buy a 30% stake in Hungary's state-owned telecommunications firm, Matav.
- US West owns 49% of the Hungarian cellular system, Westel; it is also a 25% partner with Bell Atlantic Corp. and the Czech and Slovak Republic PTTs in operating the first cellular telephone systems and public switched packet data networks (called Eurotel) in those countries.
- Vendors such as GTE/Spacenet and Scientific Atlanta are making the option of very small-aperture terminals an attractive alternative to land-based telecom options.

Executive Track

Glen Pederson, manager of database administration at **Worldspan**, was presented the 6th Annual North American Award for Information Excellence at the International DB2 Users' Group's annual conference held recently in San Diego. The award is given to a distinguished contributor to the advancement of relational technology.

Alan C. Stanford, 53, national director of information technology consulting at **Ernst & Young**, will retire from the firm on Sept. 30 to start his own consulting practice. Stanford will continue consulting select clients from Ernst & Young's Center for Business Innovation in Boston, which he founded, and where he has now been named a fellow.

The National Association of State Information Resource Executives has announced several appointments and retirements. **Jake Hoffman** has been appointed statewide information technology coordinator for the state of Idaho. He replaces **Al Arvish**, who recently resigned. **David Litchliter** has been appointed executive director at the Central Data Processing Authority in Mississippi. He replaces **John Ruffin**, who recently resigned. **Carol Purcell** is the new executive director at the Department of Information Resources in Texas. She replaces **Ann Fuelberg**, who has left Texas state government. **Linda Hibbs** has been appointed administrator of the Office of Telecommunications and Information Systems in New Jersey. She replaces **Elaine Davis**, who has left New Jersey state government. **Larry Huckabee** has retired as director of the Office of Information Technology Policy and Management, Division of Research and Statistical Services, in South Carolina. A replacement has not yet been named. **Charles Livingston** has been appointed the new director of the Department of Information Technology in Virginia. He replaces **J. Westwood Smithers Jr.**, who has left Virginia state government. **Hudnall Croasdale** is the new director of the Council on Information Management in Virginia, replacing **Patricia Jackson**, who has left the Virginia state government.

AIM Management Group in Houston has announced the appointment of **Bruce Hasenyager** to the newly created position of vice president and chief technology officer. He will report to AIM President Robert H. Graham.

Hasenyager will be responsible for the planning and management of information technology. He was previously senior vice president for corporate systems at Chemical Banking Corp. Prior to that he held senior technology management positions at Merrill Lynch & Co. and Kidder, Peabody & Co. He is also the author of *Managing Information Technology*, which is due out this fall from Quorum Books.

Claremont Technology Group, Inc., an information technology planning and project management consultancy in Beaverton, Ore., has announced the appointment of **Paul J. Cosgrove** as president and chief executive officer. Prior to joining Claremont Technology, Cosgrove was executive vice president of operations at Technology Solutions Co. He began his career with Andersen Consulting, rising to the position of managing partner of integration services and technology. He is also a director of the Information Technology Association of America.

Stanford University in California has announced **Robert L. Street** will step down this fall as head of libraries and information resources, a post he has held for the past four years. Street has also been an administrator at the university for the past 32 years. He will now take over as chair of the Civil Engineering Department for the next year.

More Executive Track, *page 84*

Strut Your Stuff

By entering *Computerworld*'s 3rd Annual Re-engineering Team of the Year Awards Competition.

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Fax us your request at (508) 875-8931

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- Displayed outstanding IS-user teamwork.

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Submissions may be made by end-user organizations and vendors, consulting firms and system integrators on behalf of their clients. Companies selected for consideration will be contacted by a *Computerworld* representative for further details and verification. The winner will be chosen by a panel of *Computerworld* editors. All entries are the property of *Computerworld*.

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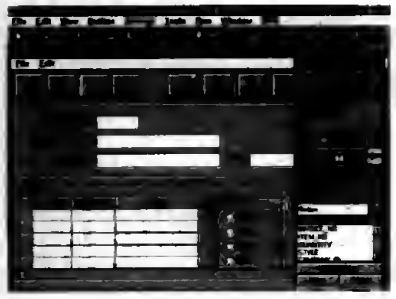
1 Relax and take a deep breath. SQLWindows® is your quickest way to build and deploy problem-solving applications just like this one. For the quickest start, choose a QuickForm to lay out your application and make all the appropriate connections.

2 QuickForms let you choose data from any database, identify fields and automatically create master/detail links. A simple button click generates your QuickForm. By the way, dBASE and Paradox® data drivers are included to help desktop developers move up.



3 Next, customize your QuickForm by choosing QuickObjects from the tools palette. Each QuickObject chosen will be automatically linked to your data sources. In this case, just drag and drop a QuickRadioGroup so users can select shirt colors with intuitive radio buttons.

4 What good are color selections in a Hawaiian shirt company if your can't see them? SQLWindows applications can easily incorporate graphical data from any file, OLE server or database with the QuickPicture QuickObject. Just place and size the picture box in your form. See? You still haven't written a lot of code!

When Molokai Outfitters opened their new branch warehouse, QuickObjects from Gupta kept their finger off the panic button. Only available in SQLWindows 5.0, QuickObjects made sure Molokai's critical sales order entry application got delivered in a flash!

Quickly build powerful client/server applications.

Now, client/server applications are in your grasp. New QuickObjects from Gupta make "drag & drop" application development a productive programming alternative to dreary, repetitive coding. In fact, any developer can now build full-featured client/server applications regardless of prior experience. Novices can skip complicated coding and veteran developers can boost productivity before resorting to code for extended functionality.

INTRODUCING SQLWindows 5.0

Four ways to a quick start and the power to finish.

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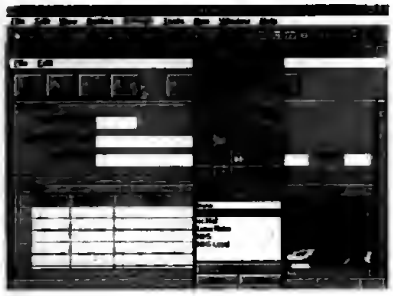
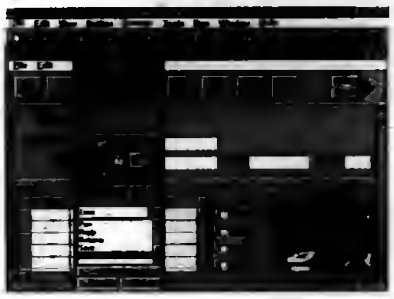
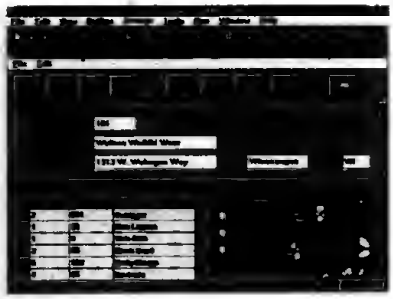
How QuickObjects™ from Gupta kept Molokai from losing its shirt.



5 Painless workgroup integration is just a point-and-click away. Select the QuickEmail object, choose your mail system from the options listed and drop an e-mail data source into your form. Now users anywhere on the network can be notified when an order affects them or requires some action on their part.



6 For instance, each order will require credit approval. This calls for an e-mail QuickObject, a pre-defined pushbutton with built-in code to execute e-mail tasks. To run credit checks via e-mail, choose the "Send" e-mail QuickObject and drop a "Send" button on your form's toolbar. Now any user of the application will be able to notify the Credit Department when an order is placed and secure their approval to ship – all via e-mail without leaving the application.



7 Now, test your application. Click on the "Run" button in the SQLWindows toolbar. Any errors will be flagged by the internal debugger and a runtime application® will be created. Then for blazing speed, just punch the adjacent SQLWindows Compiler button to tap the performance of the industry's first 4GL compiler.

8 Congratulations. You've just built a powerful client/server mail-enabled application that integrates graphical and SQL data anyone can use. And you did it in less than 15 minutes! Now, Walter's Waikiki Ware in Waconian will get the 72 dozen Outrigger shirts they need by next week and you'll be modeling Molokai Outfitters' latest styles on the very beaches that inspired them.

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Intelligence Files

A byte of pizza, please

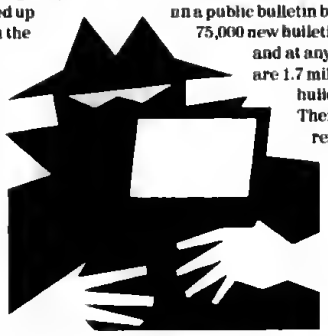
Hungry hackers in Santa Cruz, Calif., can now keep their eyes peeled on the information highway for their local Pizza Hut delivery truck. The company has announced it is now taking delivery orders on-line.

The pilot program, "PizzaNet," debuts this month in Santa Cruz. If it's successful, late night snackers may want the same service in other cities, and other franchises could follow suit. Domino's Pizza is reportedly already watching.

Ordering on-line takes no longer than ordering by phone, Pizza Hut spokesman Rob Doughty says. Pizza eravers must have Internet access to place an order. This allows them to access the centralized PizzaNet computer at Pizza Hut's headquarters in Wichita, Kan. The order is relayed by modem to a computer at the customer's nearest Pizza Hut restaurant. The local restaurant can then phone the customer to confirm the order and put the pie in the oven.

Beware electronic bandits

With the increasing number of travelers using the information highway, electronic bandits have stepped up their efforts to prey on the unsuspecting.



Enough so, in fact, that at least 24 investigations of on-line investment fraud are under way in seven states. The Washington-based North American Securities Administrators Association, which represents securities agencies in the U.S., reports that electronic hustles take a variety of forms from pyramid schemes to phony merchandise offerings and bogus stock investment opportunities. Investigators say hundreds, possibly thousands, of cases go unreported.

Because of the increase in fraud, since July, Prodigy and other on-line services have been displaying disclaimers and warnings at the beginning of their financial services bulletin boards.

Warns Prodigy spokesman Brian Ek: "You should not base any personal financial decision on what you read on a public bulletin board. We post up to 75,000 new bulletin board notes daily, and at any given time there are 1.7 million notes on 1,000 bulletin board subjects. There is no way we can read all the notes that come in on a given day or that we could even pretend to be experts on the topics they cover. Common sense says you shouldn't make any investment based on what you see on a public bulletin board."

Source: *San Jose Mercury News*

Hot in Europe

The market for business process re-engineering services in Europe is growing at an annual rate of 38% and will do so through 1998, according to the report, "Re-engineering Europe" from information technology market research firm Dataquest, Inc.

Although business process re-engineering is often dismissed as a buzzword, according to the research firm, the market does exist and is in the early stages of development. Dataquest estimates the European market was $149 million last year.

"The impact a vendor has on a customer's business processes is fast becoming the basis of differentiation for [information technology] services companies," said Puni Rajah, a Dataquest analyst. "To survive in the 1990s, [information technology] service companies need to provide BPR services either directly or through partners."

Meanwhile, in Australia, relatively few government departments have yet done much business process re-engineering. The exception is the Australian Taxation Department, which has been employing business process re-engineering principles in its Tax Office modernization program.

Source: IDG News Service

Tracking IS on campus

Cause, the association for managing and using information resources in higher education, has a new electronic newsletter, "Campus Watch" offers information on the effective management of information systems in higher education and highlights information technology-related projects of note. To subscribe, send an E-mail to mailserv@cause.colorado.edu with the message: subscribe campuswatch.

Executive Track

Sallie Mae in Washington has announced the appointment of **Edith W. Martin**, 49, to the newly created post of executive vice president and chief technology officer. She will be responsible for adding new technology to Sallie Mae's current and emerging business lines and leading the corporation's investment in hardware, software and systems. Prior to joining Sallie Mae, Martin was vice president and chief information officer at Intelsat, where she led a large-scale transition from mainframe to client/server-based systems, installed launch and control facilities and produced a network control system to support Intelsat satellites. She has also held executive positions at The Boeing Co. and Control Data Corp. and served in the U.S. Department of Defense as deputy undersecretary of defense for research and advanced technology.

Helene Curtis, Inc. in Chicago has announced the appointment of **Thomas J. Gildea**, 50, to the newly created position of CIO. He will be responsible for developing and implementing the company's business information efforts from a global and strategic perspective. He will retain the title of corporate vice president. Prior to joining Helene Curtis, Gildea was director of applications systems development at Searle Pharmaceuticals.

U.S. Computer Services in Sacramento, Calif., has announced the appointment of **Jerry Johnson** as vice president of system development. He will report to Dave Sanders, senior vice president of technology and development. Johnson's responsibilities include designing application architectures, establishing the development environment for database administration and developing graphical user interfaces. Prior to joining U.S. Computer, Johnson was president of his own development and consulting firm, OpenWorks, Inc. He has also held management positions at Planning Research Corp. and MCI Communications Corp. in Washington, and Mitre Corp. and Telwatch in the Sacramento area.

Xyplex, Inc. in Boxboro, Mass., has announced the appointment of **David L. Fucci** as manager of technical operations. He will be responsible for managing all technical and engineering activities within the manufacturing organization. He will also be responsible for developing and implementing technical strategies in support of production, materials and quality. Prior to joining Xyplex, Fucci was director of operations at DTR Corp. He has also held positions at Prime Computer, Digital Equipment Corp. and Data General Corp.

Alydaar Software Corp. in Madisonville, La., has announced the appointment of **Barry G. Litherland** as director of the company's newly formed federal services division. He will oversee development and sales of all government computer language translations, migration and re-engineering efforts. Prior to joining Alydaar, Litherland was chief, systems technology division of the U.S. Air Force Wargaming Institute. He was also one of five charter members of the Air Education and Training Command's Major Command Software Reuse Committee.

Bell & Howell in Lehigh Valley, Pa., has announced the appointment of **Ashish K. Mikerji** as vice president of worldwide information systems. He will report to Robert Stirling, president of Bell & Howell Phillipsburg. Mikerji's responsibilities will include developing and implementing global IS strategies. Prior to joining Bell & Howell, he was responsible for IS, hardware, software, application development and data/voice networks at Motorola/Codex Corp.

May & Speh, an information management services company in Downers, Ill., has announced the appointment of **Guenther Schlesak** as senior systems programmer. He will be responsible for providing technical support services for MVS mainframe operating systems and related software. Prior to joining May & Speh, he was a technical services manager at Bell & Howell's information services division.

MCI Communications Corp. in Washington has announced the appointment of **Richard A. Bolandz** to the newly created position of vice president of business strategy and technology. Prior to joining MCI, Bolandz was chief information officer of PHH Corp., a Fortune 100 financial services company. He previously headed CSC Index Group's business process re-engineering practice.

Allied Signal, Inc. in Morristown, N.J., has announced the appointment of **Kathy Brittain White** to the newly created position of vice president of information systems and services at the company's engineered materials sector. She was previously director of information management at the division.

White will report to Frederic M. Poses, Allied Signal's engineered materials president. Her responsibilities will include overseeing all IS activities for the fibers, chemicals, plastics and advanced materials businesses.

James R. Wagner, director of IS at the **University of Iowa Hospitals & Clinics** in Iowa City, has been elected chairman of the **College of Healthcare Information Management Executives** for 1995.

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Calendar

SEPT. 25 - OCT. 1

1994 Users Group Technical Conference. Greenville, S.C., Sept. 25-28 — Contact: Elizabeth Davis Peeler, Datastream Systems, Inc., Greenville, S.C. (803) 297-6775

Bull Users Society Amaricas 1994 Conference. Phoenix, Sept. 25-28. Cost is $545 for members, $800 for nonmembers. — Contact: Bull Worldwide Information Systems, Inc., Billerica, Mass. (508) 294-6000

The Enterprise Applications Symposium: A Technical Conference & Exposition for Banyan Developers and Association of Banyan Users International members. Providence, R.I., Sept. 25-28 — Keynote: Scott Adams, cartoonist and creator of "Dilbert," on today's workplace environment. Contact: The Enterprise Applications Symposium, Chicago, Ill. (800) 730-2284

Graph Expo East. Philadelphia, Sept. 25-28 — Contact: Graphic Arts Education and Research Foundation, Reston, Va. (703) 264-7200

Seventh Annual Symposium: Implementing Solutions Today. Nashville, Sept. 25-28 — Contact: Automatic Meter Reading Association, Northbrook, Ill. (708) 480-9628

Symposium 1994. Orlando, Fla., Sept. 25-28 — Keynote: James Capeless, president and CEO of Vmark, Inc. Contact: *Infocus Magazine*, Yardley, Pa. (215) 321-2200.

ARMA International 39th Annual Conference. Toronto, Sept. 25-29 — A five-day educational forum for records managers, information systems managers, librarians, office managers, archivists and micrographics specialists. Cost is $680 for members, $820 for nonmembers. Contact: The Association of Records Managers and Administrators, Inc., Prairie Village, Kan. (800) 422-2762.

The Business Applications of Video Game Technology. Los Angeles, Sept. 26 — Keynotes: Michael Sehrage, research associate at MIT's Sloan School, and John Hiles, president of Thinking Tools. Contact: Cambridge Technology Partners, Cambridge, Mass. (617) 374-8376.

Electronic Books '94. New York, Sept. 26 — Second annual conference and exhibit on the emergence of electronic books and their impact on traditional media, markets and applications. Contact: Schwartz Public Relations Associates, Inc., New York, N.Y. (212) 677-8700

Client/Server Computing. New York, Sept. 26-27 — Contact: Advanced Information Technologies, Upper Montclair, N.J. (201) 509-2905.

Effective Methods of Systems Testing. San Jose, Calif., Sept. 26-27 — Part 1: Process for system test planning; Sept. 28-29 — Part 2: Process for test execution. Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

The Knowledge Advantage: Solutions in Practice. Boston, Sept. 26-27 — Topics: The Knowledge-based Organization; A Managerial Revolution; Dealing with Information Overload; Leveraging Learning Relationships with Customers. Contact: The Planning Forum, Oxford, Ohio (513) 523-4185

The Networked Economy Conference: Towards the Global Information Superhighway. Washington, Sept. 26-27 — This two-day summit explores the issues surrounding the convergence of the computing, software, communications, electronics and cable industries. Speakers: Robert E. Allen, chairman and CEO of AT&T Corp.; John C. Malone, president and CEO of TeleCommunications, Inc.; Andrew S. Grove, president and CEO of Intel Corp., and Reed Hundt, chairman of the Federal Communications Commission. Cost is $1,200. Contact: Alexander Communications, San Francisco, Calif. (415) 923-1660

Managing & Supporting Windows. Hartford, Conn., Sept. 26-27 — Contact: Advanced Information Technologies, Upper Montclair, N.J. (201) 509-2905.

Application Development Conference. Coronado, Calif., Sept. 26-28. — Conference reviews the challenges facing developers, including middleware-driven enterprise architecture, data warehousing, object-oriented development and application package integration. Contact: Meta Group, Inc., Westport, Conn. (203) 226-6382

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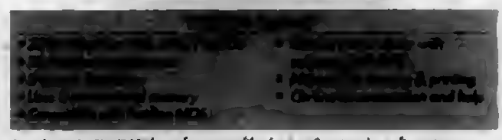

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SWITCHES' BREW

Ethernet and Token Ring switches are key ingredients in high-speed internetworking, but ATM may be the potion of the future

by Paul Zagaeski

Asynchronous Transfer Mode (ATM), with its mystical, magical ability to deliver incredible bandwidth and make possible nearly limitless access to data of all descriptions, is expected to loom large in the network specialist's future. But a shortage of available products, standards uncertainties and high prices will limit ATM's role as an end-to-end connection for a few years (see story page 98).

For now, switching technology is bewitching the networking industry with its here-and-now ability to relieve network congestion and boost bandwidth.

Switching, the foundation of cell-switching ATM, has been applied to standard Ethernet, Token Ring and Fiber Distributed Data Interface (FDDI). Switch-

Switches, *page 93*

USER RATINGS

To find out why people are happier with hubs than routers, see our Buyers' Satisfaction Scorecard ratings of hubs from **SynOptics, Cabletron** and **Chipcom** and routers from **Cisco, Wellfleet** and **3Com**, *page 101*.

REAL, LIVE ATM

For a look at how users who have implemented ATM view the technology, check out our Firing Line evaluation of **SynOptics' LattisCell** ATM switch, *page 98*.

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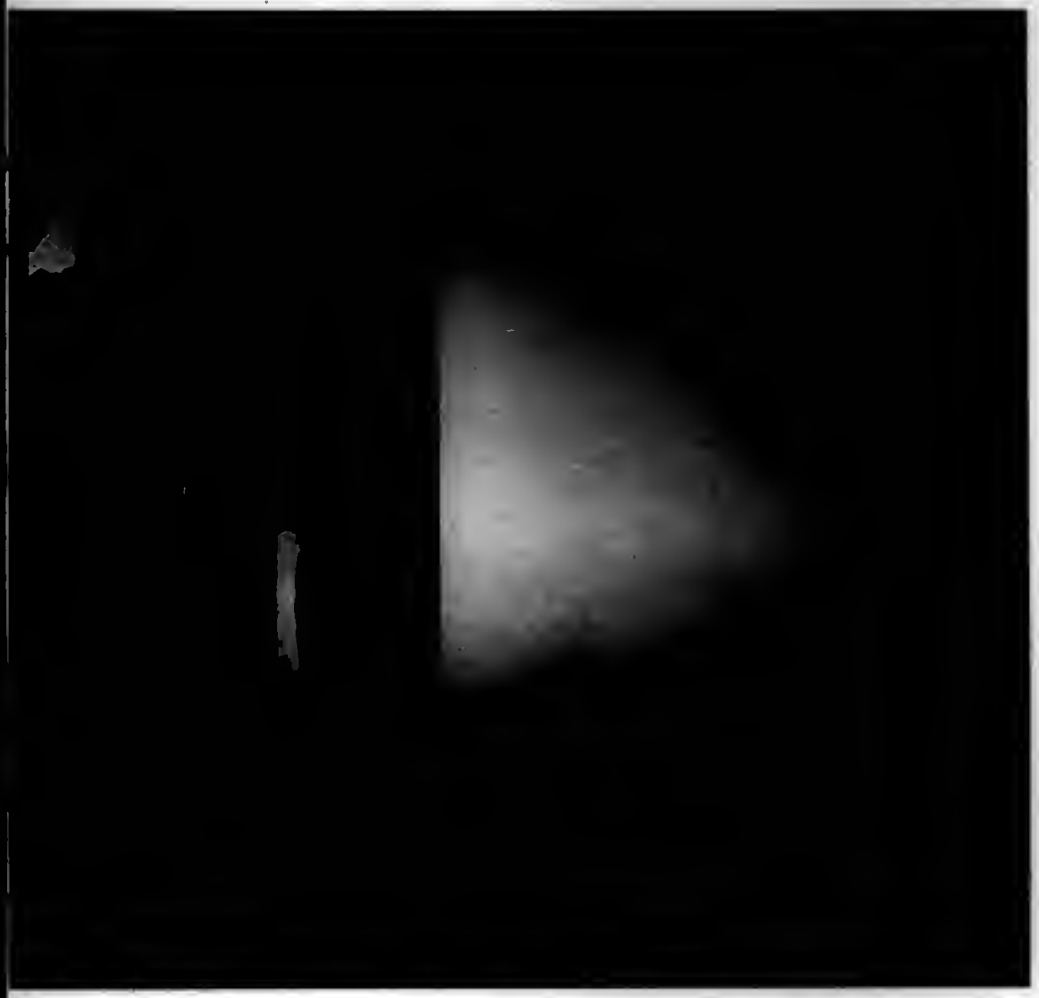

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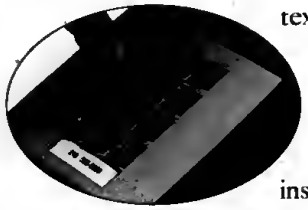

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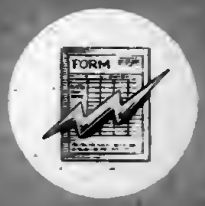

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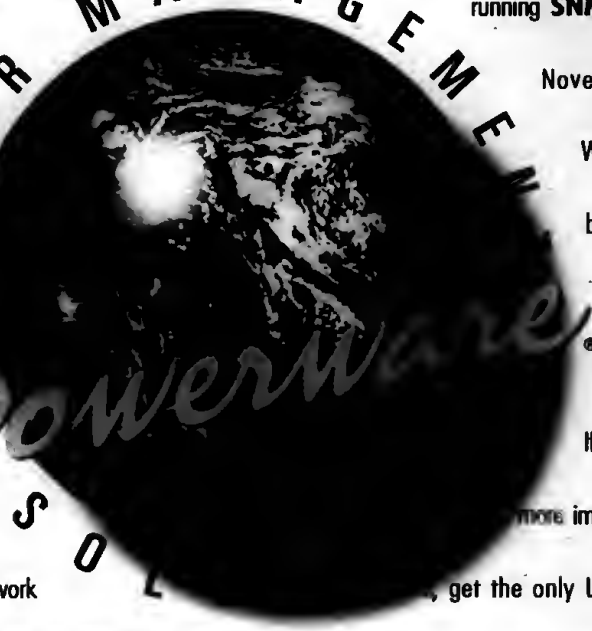

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SWITCHES

CONTINUED FROM PAGE 89

ing, which can be managed with existing network applications, provides the advantages of more expensive bridged or routed networks at a lower cost because it's cheaper to set up and maintain.

SWITCHING HOUR

Switching technology first appeared in 1990, when Kalpana, Inc. introduced EtherSwitch. Other vendors hesitated to enter the LAN switch market because users were unclear about switching's technological underpinning and compatibility with existing products. Also, switches are more expensive than nonswitching hubs. Users wanted to be certain they were getting more bandwidth for their money.

Two years ago, vendors such as Ungermann-Bass, Inc. finally announced their own switching products, and 1993 was the first year of widespread user acceptance.

The sudden conversion of users to LAN switching has many networking companies that already have switching products rubbing their hands together in gleeful anticipation. In fact, the perceived demand for switching started a stampede last year among the largest networking companies to buy out, merge or partner with companies ahead of them in developing and marketing LAN switching products (see chart above).

Perhaps most significant is the still-pending merger of SynOptics Communications, Inc. and Wellfleet Communications, Inc. Part of Wellfleet's motivation in agreeing to the merger was to ensure its routing technology could evolve and find a home in less expensive switching products from the combined corporation. SynOptics can use Wellfleet's customer base to compete with Cabletron Systems, Inc. and 3Com Corp.

'BESWITCHED'

Switching solves network congestion in two ways. It allows a network to be divided into smaller segments, thereby isolating the physical devices that generate the most traffic. This same benefit is offered by bridges and routers. Switches, however, also increase performance by providing dedicated bandwidth to individual network devices as needed. Essentially, devices can take advantage of the full capacity of the network they're connected to — even if that network is based on shared-media technology such as Ethernet. This means each segment of an Ethernet subnet, or each individual user connected directly to a hub port, has full 10M bit/sec. throughput available.

Switching can be combined with full-duplex Ethernet (which allows simultaneous send and receive) to create 20M bit/sec. dedicated throughput. It has also been added to Token Ring (see story page 97); FDDI, which creates 100M bit/sec. throughput on fiber; and "fast" Ethernet and 100VG-AnyLAN, technologies that create 100M bit/sec. throughput on unshielded twisted-pair cable.

CATEGORICALLY SPEAKING

There are two types of LAN switches. A port assignment switch, not a true switch, simply allows two ports to be dedicated to each other without requiring a cable patch. Bytex Corp. and Chipcom Corp. switches are port assignment switches.

The other type of switch falls into one of four categories. There are simple workgroup switches, generally sold as stand-alone devices whose switched connections let individual devices or subsegments communicate at full wire speed. These devices can act as bridges to other network segments, but they cannot translate protocols or dedicate more bandwidth to a single device such as a server. The average cost to the end user is about $900 per port.

A second type of workgroup switch provides a high-speed link on one or more ports to support a "fat pipe" to a server or network backbone. 3Com's LinkBuilder MSH/LinkSwitch, Grand Junction Network, Inc.'s FastSwitch, Kalpana's EtherSwitch EPS, SynOptics' EtherCell, Cisco System, Inc.'s Catalyst stackable switch and Network Peripherals, Inc.'s EIFO all fit into this category. Their costs range from $300 to $1,200 per segment, depending on whether it is a hub module or a stand-alone device.

The third category is a department-level switch, which is often used to link workgroup networks. These switches include more high-performance and management features, such as support for spanning tree architecture (which allows data to traverse a network by alternate pathways), packet filtering (to keep packets intended for a local destination from entering the backbone network), redundant power supplies and hot-swap capabilities.

Artel Communications Corp.'s (now Chipcom's) Galactica SuperSwitch, UB's DragonSwitch, SynOptics' LattisSwitch, Cabletron's MMAC and 3Com's LANPlex 5000 fall into the departmental switch category, and their average cost is $1,500 to $2,000 per network segment.

The fourth category is the enterprise switch, which has routing functions that let it act as the central data traffic cop, determining the most efficient paths for all the data streams throughout the enterprise. Naturally, it can support a large number of LAN connections.

Alantec, Inc.'s Powerhub, Cabletron's MMAC-Plus, Chipcom's OnCore Switching System, SynOptics' System 3000 and 5000 and 3Com's LANPlex 6000 fit into the enterprise switch category. Priced from $2,000 to $4,000 per segment, switching hubs in this category are the ones creating sleepless nights for router product managers. These hubs can take the place of routers at about the same unit cost and are far less complex to set up and maintain.

Most of the enterprise switch vendors are introducing ATM modules, which means these switching hubs will be the first components upgraded when a company begins to add ATM to its network. ATM is being used only as a backbone transport in most networks, so these hubs need an ATM module to link the hub to the backbone. Future versions of some of these enterprise hubs will incorporate ATM switching into the hub itself, making the hub's own backplane an ATM network. Ethernet-to-ATM translation technologies will also appear in the hubs themselves.

ROUTER ROUTE

Router product vendors, faced with the overwhelming price/performance advantage of switches, can rely on a basic truth of networking. Many companies have already deployed router-based internetworks and will be reluctant to toss out that investment.

Many companies upgrade by introducing switches between routers and the networks they serve. The switches can open up bandwidth in the segments, while the routers maintain security and perform more complex tasks such as protocol conversion.

The switches available today, from workgroup switching hubs to switch modules in enterprise hubs, have one thing in common: built-in obsolescence. It's not that today's switching hubs will become useless; it's simply that the roaring pace of product development — common in the PC industry — is now the norm in networking, too. With ATM products plummeting down the price curve already, hub and router vendors will be under tremendous pressure to develop standards-based ATM networking products for workgroup, departmental and enterprise implementation.

The most significant push will be for LAN emulation standards, which will preserve the investment in "legacy LAN" technologies while a company makes the change to ATM. Today's Ethernet, Token Ring and other switches will have to successfully coexist with the coming ATM revolution.

Today's investment in switching is simply a prelude to the more significant investment most companies will face within five years — fortunately, one that will not require companies to abandon the switching products they put in place in 1994. ■

Zagacki is a senior analyst in the Network Products Group at Computer Intelligence/InfoCorp in Westboro, Mass.

SWITCHING-RELATED MERGERS AND ACQUISITIONS

[illegible]	Cisco Systems, Inc. acquires Crescendo Communications, Inc.
[illegible]	Network Systems Corp. acquires Bytex Corp.
[illegible]	Network Systems and Storage Technology Corp. agree to merge
[illegible]	Chipcom Corp. acquires Artel Communications Corp.
[illegible]	3Com Corp. acquires Synernetics, Inc.
[illegible]	Chipcom acquires David Systems, Inc.
[illegible]	SynOptics and Wellfleet agree to merge
[illegible] 1994	Chipcom and Cisco Systems announce worldwide partnership

FAST FACT

Computer Intelligence/InfoCorp estimates that of the 17 million intelligent hub ports shipped worldwide in 1993, only about 90,000 were switched ports. However, this year shipments should top 200,000 switched ports. Total manufacturer revenue from switching products was about $75 million in 1993, but CI/InfoCorp forecasts that will grow to nearly $160 million this year. Switching hubs are adversely affecting revenue from router products.

FAST FACT

The difference between switches and routers is this: Switches process packets more efficiently. For example, routers are designed to operate at the ISO Network Model's Layer 3 (the network layer), which requires the router to perform more complex processing than a switch. A switch operates only at Layer 2 (the media-access control layer).

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Dispelling doubts about Token Ring switching

Vendors tackle speed problems with a variety of solutions

BY PAUL ZAGAESKI

Clouds of uncertainty surround Token Ring switching and its products' ability to find their way into corporate networks. But vendors such as IBM, Madge Networks, Inc. and Oficom USA, Inc. are working hard to make the path more visible.

Some Token Ring vendors, including IBM, say current Token Ring protocols are not appropriate for switching. Token Ring, which like Ethernet is a shared-media technology, is inherently more resistant to the slowdowns caused by packet collisions. For this reason, Token Ring protocols are not optimized for moving packets quickly in and out of network devices — and they don't need to be.

But if data packets can't get in and out of devices quickly, what's the advantage of having a more efficient switching network to carry the packets to and from the devices? The speed gained by having more bandwidth in the network is lost as the packets have to squeeze out of the sending devices and into the receivers.

'Ring' leader

IBM has proposed a new protocol, Dedicated Token Ring, that presumably supplies this optimization. The standard is now before the Institute of Electrical and Electronic Engineers, Inc. 802.5 committee. Dedicated Token Ring will dispense with the token-passing part of the Token Ring protocol. It also splits a ring into separate segments, each dedicated to a single ring station. Finally, it creates a standard for full-duplex Token Ring.

While Dedicated Token Ring will create the faster packet-processing that makes switching worthwhile, it will also make Token Ring devices more expensive. Also, the network interface cards on existing networks would need upgrades to be compatible with the new standard.

Madge Networks, already considered a leader in Token Ring engineering and technology, has proposed a different approach to Token Ring switching. Madge has developed special protocol-handling routines, which will be encoded in a protocol handler application-specific integrated circuit called the Ring Runner chip set. The Ring Runner makes it possible to employ "cut-through switching" in a Token Ring network.

Cut-through technology is used in Ethernet switching devices. It is a technique that reads address information from a data packet and forwards the packet without reading the entire packet into a memory buffer. This low-latency technique makes switching practical and fast. Existing Token Ring switching products from Standard Microsystems Corp. and Fibronics International, Inc. use a store-and-forward technique that slows down the number of packets the switch can process per second.

Other vendors have taken a more cautious approach to Token Ring switching. Oficom intends to introduce switching products that are not based on IBM's Dedicated Token Ring protocol. Its products focus on creating a connection between existing unswitched Token Ring networks and ATM backbone networks. Because Oficom says the added cost and complexity of the Dedicated Token Ring protocol will be a deterrent, it has taken the position that customers will want a migration path to ATM backbone connections without adding new Token Ring protocol support to their networks. ■

Zagaeski is a senior analyst in the Network Products Group at Computer Intelligence/InfoCorp in Westboro, Mass.

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RACAL
Communicating through technology

While ATM has come far in the past year, it still has a ways to go before it is widely adopted

THE LONG AND WINDING ROAD...TO ATM

BY STEPHEN P. KLETT JR.

Most observers agree that the internetworking road to the future will lead to ATM. However, exactly how long that road is and how stable it is remains subject to debate.

ATM is a protocol capable of carrying voice, data and video traffic faster than any of today's transmission protocols.

For example, ATM transmission rates are scalable from 51M bit/sec. to more than 600M bit/sec. and, eventually, gigabit/sec. speeds. In comparison, Ethernet and Token Ring move a maximum of 10M and 16M bit/sec., respectively, while Fiber Distributed Data Interface (FDDI) hits 100M bit/sec.

As with any new technology, ATM's hurdles to date have been a lack of available products, high prices and incomplete standards. Announcements from ATM stalwarts such as Fore Systems, Inc. in Warrendale, Pa., Newbridge Networks, Inc. in Herndon, Va., and IBM in Research Triangle Park, N.C., have made progress toward clearing the first two.

SANS STANDARDS

IBM unveiled its Nways family of ATM switches and 25M bit/sec. ATM strategy at prices around $1,000 per port, and Fore and Newbridge cut adapter prices by as much as 50% earlier this year. However, standards remain a serious obstacle to ATM's widespread acceptance, analysts say [CW, July 11].

The ATM Forum, an industry consortium based in Mountain View, Calif., is charged with defining ATM standards. Some of the critical areas the group is currently focusing on include the following: LAN emulation, signaling, congestion management/traffic control and user interface standards.

A standard for LAN emulation is critical because it will enable ATM hardware to work with users' existing Ethernet, Token Ring and FDDI LANs. A completed draft specification for LAN emulation, originally slated for the end of this year, has been pushed back to early next year or maybe even year's end, according to some observers.

However, Ron Jeffries, principal at Jeffries Research and editor of "ATM User," a newsletter in Santa Maria, Calif., says he does not believe that will be the case. "The industry understands that without a LAN emulation spec, ATM is not really going to get off the ground, so a lot of energy is going into making it happen. It should be at a point early next year where the forum can approve it," Jeffries says.

STILL A WAYS TO GO

Other standards, however, are in rougher shape. For example, a standard for traffic control/congestion management will most likely not appear until at least the end of next year.

Earlier this year the forum completed Version 3.0 of the user-to-network interface standard, which specifies how switches from different vendors will in-

Firing Line: SynOptics' LattisCell ATM switch earns high marks for speed, ease of installation, but users await price drop

ATM is not something most organizations need right now, but there are a few exceptions. One of them is the Naval Command Control and Ocean Surveillance Center in San Diego.

Charged with turning technology from defense to civil service purposes, the center aimed a satellite at Hawaii to see how fast it could collect data on damage from a natural disaster such as a hurricane. The transfer of image data files such as these, which are greater than 100M bits, took four to eight hours over the Internet. The center transferred them in only eight minutes using SynOptics Communications, Inc.'s LattisCell ATM switch.

The center was one of three evaluators we tapped to rate LattisCell, one of the leading ATM products. The other organizations included a health care radiology laboratory and a semiconductor laboratory.

Users were able to get LattisCell installed and running in little time, but users complained that certain modules required Sun Microsystems, Inc.'s Solaris while others still ran on SunOS.

The survey was developed with assistance from Howard Rubin and Associates and Technology Investment Strategies Corp. Ron Jeffries, principal at Jeffries Research in Santa Maria, Calif., contributed to this evaluation.

EASE OF INSTALLATION

The evaluators said the installation of the switch was as easy as plug and play.

Health care laboratory: "The only thing we had to do was install SynOptics' Connection Management System on the Sun SPARCstation and connect it to the switch. The auto configuration feature did everything else."

LAN INTEGRATION

SynOptics' EtherCell switch, which provides the interface between the LattisCell and distributed hubs, was called "limited" by one user.

Health care laboratory: "We have been forced to use a SPARCstation as a router for our integration because the EtherCell product can handle only 256 outside Ethernet connections, too few for the number of Ethernet ports we have. We are waiting for the next release of EtherCell so that we can do it right."

RELIABILITY

None of the evaluators had the ATM switch running longer than five months. No problems occurred in that time.

Research and development: "It worked right out of the box without any

SynOptics responds

Operating system: The next version of the Connection Management Systems, which now requires SunOS, will support Solaris.

Likewise, the SBus adapter cards, now requiring Solaris, will support SunOS, so all combinations will be available.

Adapter cards: SynOptics does not have any plans to build anything but SBus adapter cards. Instead, the company will work toward increased interoperability with other vendors' products to achieve the same type of connectivity as today's Ethernet and Token Ring networks.

teroperate. However, an update to 3.0 that is due soon may raise some incompatibility issues, according to analysts.

Until these standards are set and incorporated into vendors' products, ATM will remain a niche technology. Users will continue to use ATM in isolated pockets on their networks where bandwidth is at a premium but will not run mission-critical applications on it.

In the meantime, users will continue to look to switching products as Band-Aids until ATM is ready for prime time.

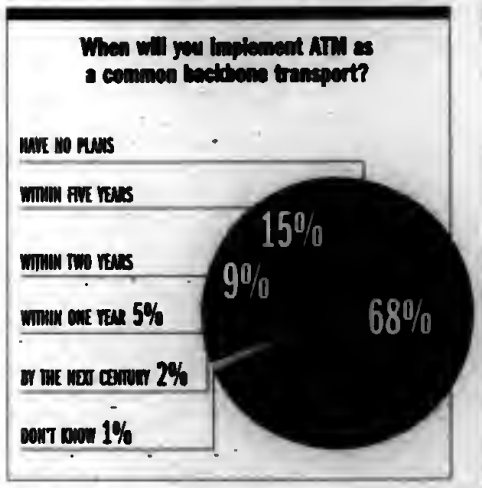
"ATM is our ultimate destination, but until it is more mature and affordable we will look to switching to give our network a boost," says Graham Morrison, project leader at Blue Cross/Blue Shield of Connecticut in North Haven, Conn.

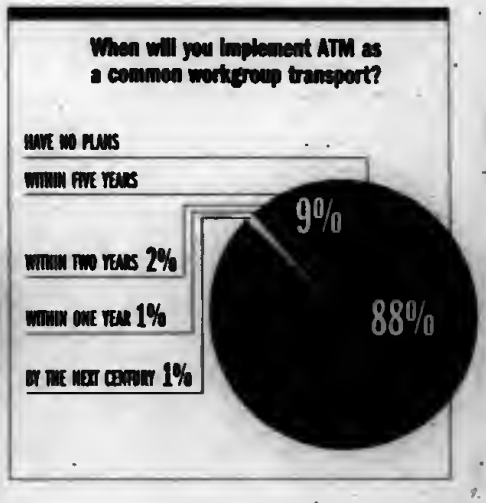
Despite the standards pains, analysts such as Jeffries remain bullish on ATM and see a light at the end of the ATM tunnel. "Things are only going to get better as more vendors ship equipment," Jeffries says. "For example, Fore has publicly said it has 300 or 400 customers out there, which is a lot, and we don't see a lot of pain — this stuff already works." ■

Klett is a *Computerworld* staff writer.

SIMPLY RESISTIBLE

Despite the dazzling capabilities of ATM, networking users are dragging their heels





Source: Buyers' Satisfaction Scorecard survey

hardware problems at all."

Health care laboratory: "The switch is controlled by a Sun SPARCstation, which went down once and subsequently shut down the switch. That was the only instance that was no fault of the switch."

NETWORK MANAGEMENT

Evaluators said network management was easily done with SunNet Manager once they were familiar with it, but the operating systems requirements left them confused.

Research and development: "The auto configuration feature makes management easy, but the operating systems requirements need some attention from SynOptics. The connection management software runs under SunNet Manager but requires a SPARCstation running SunOS 4.1.3. Then the adapter cards, which allow workstations direct access to ATM, require Solaris."

Health care laboratory: "Once you get past the learning curve of the new technology, managing the network and the traffic is fairly easy."

TRAFFIC MANAGEMENT

Users described the congestion management feature as fairly easy to learn and use, although an industry standard for traffic control probably will not materialize until the end of next year.

Research and development: "Our people who do this work for us had a lot of internetworking knowledge that could be reused."

THROUGHPUT

With LattisCell's 155M bit/sec. data speed, the workstation will reach its capacity before the switch.

Semiconductor laboratory: "We have not been able to find the limit of the switch yet. Our bottlenecks have occurred at the workstation level."

INTEROPERABILITY WITH OTHER CARDS

Because the SynOptics cards run only under Solaris, using adapter cards from other vendors was necessary for at least one evaluator.

Research and development: "Since we have a limited number of places where we can use the SynOptics cards, we have been forced to use cards from other vendors such as Fore Systems and Interphase — all which have worked well with LattisCell."

SUPPORT

Because the documentation was not complete in time for the earliest users, SynOptics' support has given added attention.

Research and development: "We have had a lot of extra engineering support from them. They have been on-site with us two or three times a week."

VALUE

The LattisCell solution is made up of several separately priced product options that increase functionality and value as needed. Given ATM's pricing reputation, none of the users complained of sticker shock. They instead said they actually felt they were getting what they paid for.

Health care laboratory: "I expected the cost to be high — and it was. I also expect costs to decrease rapidly. We will wait and see." ■

Written by Computerworld *senior researcher Kevin Burden.*

SynOptics' LattisCell

SynOptics Communications, Inc.
Santa Clara, Calif. (408) 988-2400

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations.

3.7	TOTAL SCORE
4.3	INSTALLATION
3.3	INTEGRATION WITH EXISTING LANS
4.7	RELIABILITY
3.3	NETWORK MANAGEMENT SYSTEM
3.3	TRAFFIC MANAGEMENT
4.3	ATM-TO-ATM THROUGHPUT
3.0	ROUTER INTEROPERABILITY
3.7	INTEROPERABILITY WITH OTHER ATM ADAPTERS
3.7	SERVICE AND SUPPORT
3.7	VALUE

Requires an additional $10,000 EtherCell switch which fell short of one user's needs. See above under LAN integration

Evaluators had not yet hooked up their routers

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Summit 94

Buyers' Scorecard: Hubs top routers; SynOptics, Chipcom rate highest

Switches of one kind or another are on everyone's mind, but routers and hubs are what you'll find in most networks today, and hubs in particular make people happy.

Computerworld's Buyers' Satisfaction Scorecard evaluated the leaders in these two categories, collecting 300 responses from 50 users of the market-leading products.

"Hubs are easier to use and understand. They have more bells and whistles," says Paul Zagaeski, an analyst at Computer Intelligence/InfoCorp in Westboro, Mass. "Routers are more complex and focused on passing packets."

Although there is little real technical difference in terms of product features between SynOptics Communications, Inc. and its closest competitor, Cabletron Systems, Inc., SynOptics' marketing image has positioned it as the premium hub vendor, according to Zagaeski.

Key areas of strength for SynOptics' LattisNet 3000 and 5000 hubs include reliability and performance. Users cited "ease and speed of recovery" and "low memory usage."

The product's weakness is cost. The majority of users surveyed said the greatest improvement SynOptics could make would be to reduce its prices. The key area of expense for LattisNet users is the management software, which is sold in separate modules.

Tough to use

Hub vendor Cabletron also boasts management software with advanced features. Its Spectrum package runs with the Multi Media Access Center (MMAC) and MMAC Plus lines. Users were not impressed with this product, scoring MMAC lowest in ease of operation.

Cabletron has focused on scalability with the recent delivery of a packet/cell switched backplane in MMAC Plus. This allows LANs to be directly interconnected, unlike the traditional multichannel backplane, which separates LANs into different channels and requires router cards inserted into the hub to connect them. The traditional approach fills up hub slots quickly, reducing scalability.

Chipcom Corp. runs third in hub market share, according to CI/InfoCorp, and focuses on the IBM arena. The chief user complaint with Chipcom's Online Concentrator is a lack of management capability, which may be related to the product's use in sites dominated by IBM's NetView management system. Chipcom has less flexibility in developing independent management functions.

Users gave Chipcom the highest score among all vendors for support, saying that it is "fast and knowledgeable." Users also scored the product high in ease of installation, citing "good documentation." Chipcom also received high marks for ease of configuration management, with users saying it is "quick and easy." The company's management applications include Ondemand and Oncore.

Chipcom also topped the scalability rating, which includes scalability and the ability to incorporate new technologies. The company's new Openhub Platform allows third-party networking vendors to incorporate their technology into Chipcom hubs.

In the router sector, Cisco Systems, Inc.'s AGS and 7000 cover a wide range of router configurations, with the 7000 providing top-of-the-line reliability through hot swapping and power sharing.

The Cisco product lines scored low in ease of use because of what users described as "poor menus and a difficult interface."

"It's a matter of personal preference. Cisco's command line interface is nongraphical, and some users don't like that. But if you are using it constantly and you have to access it from a nongraphical remote system, it's just right," says Scott Bradner, a consultant at Harvard University's Office of Information Technology.

Support problems

Wellfleet Communications, Inc., which has been struggling financially, received more bad news, with low scores in failure recovery, value and speed. However, according to tests run by Bradner, Wellfleet outperforms Cisco in certain settings.

Support was the area most in need of improvement, users said. A quarter of them called support "poor" and said personnel "lacked knowledge."

3Com Corp. scored low in performance, but the company is addressing this area through a unique implementation of IBM's Advanced Peer-to-Peer Networking (APPN) scheme. The Tolly Group, a networking consultancy in Manasquan, N.J., tested the company's NetBuilder II product's APPN implementation and found solid performance — 1.457M bit/sec. for a packet size of 4,096 bytes of Request/Receive Units.

The firm recently beefed up security management, which scored low in this survey, with the OnLine 10BaseT Security Module. It is addressing its low score in incorporating the latest technology by introducing an Integrated Services Digital Network interface late this year.

Buyers' Satisfaction Scorecard was compiled by First Market Research Corp. in Austin, Texas, using a random sample of sites from the *Computerworld* Database Division and vendors. For further information, contact us at (800) 343-6474, ext. 299, or on the Internet: mstrainor@cw.com. ●

Written by Michael L. Sullivan-Trainor, Computerworld senior editor, and Kevin Burden, senior researcher, CW Guide.

BUYERS' SATISFACTION SCORECARD

All ratings are based on a 1-to-10 scale, where 10 is best. Categories are weighted by importance to the users surveyed.

				CATEGORIES	1	2	3	4	5	6	7
				HUBS							
SYNOPTICS' LATTISNET 3000 AND 5000	CHIPCOM'S ONLINE CONCENTRATOR	CABLETRON'S MMAC		SYNOPTICS	8.1	7.4	7.9	7.0	7.0	6.9	6.6
7.3	7.0	6.6		CHIPCOM	7.9	7.4	7.0	6.6	6.9	6.8	6.5
				CABLETRON	7.3	7.0	7.2	6.1	6.2	6.2	6.1
				ROUTERS							
CISCO'S 2000, 3000 AND 7000	WELLFLEET'S BACKBONE NODE	3COM'S NETBUILDER		CISCO	7.5	7.0	6.9	6.4	6.0	6.0	5.6
6.5	6.3	6.2		WELLFLEET	7.2	6.1	7.1	6.1	5.9	6.0	5.6
				3COM	7.4	6.3	6.9	6.2	5.7	6.0	6.1

Late to market with ISDN due in late 1994

COMPANIES PROFILED IN THIS SCORECARD

HUBS		
SynOptics Communications, Inc.	Santa Clara, Calif.	(408) 988-2400
Cabletron Systems, Inc.	Rochester, N.H.	(603) 332-9400
Chipcom Corp.	Southboro, Mass.	(508) 460-8000
ROUTERS		
Cisco Systems, Inc.	Menlo Park, Calif.	(415) 326-1941
Wellfleet Communications, Inc.	Billerica, Mass.	(508) 670-8888
3Com Corp.	Santa Clara, Calif.	(408) 764-5000

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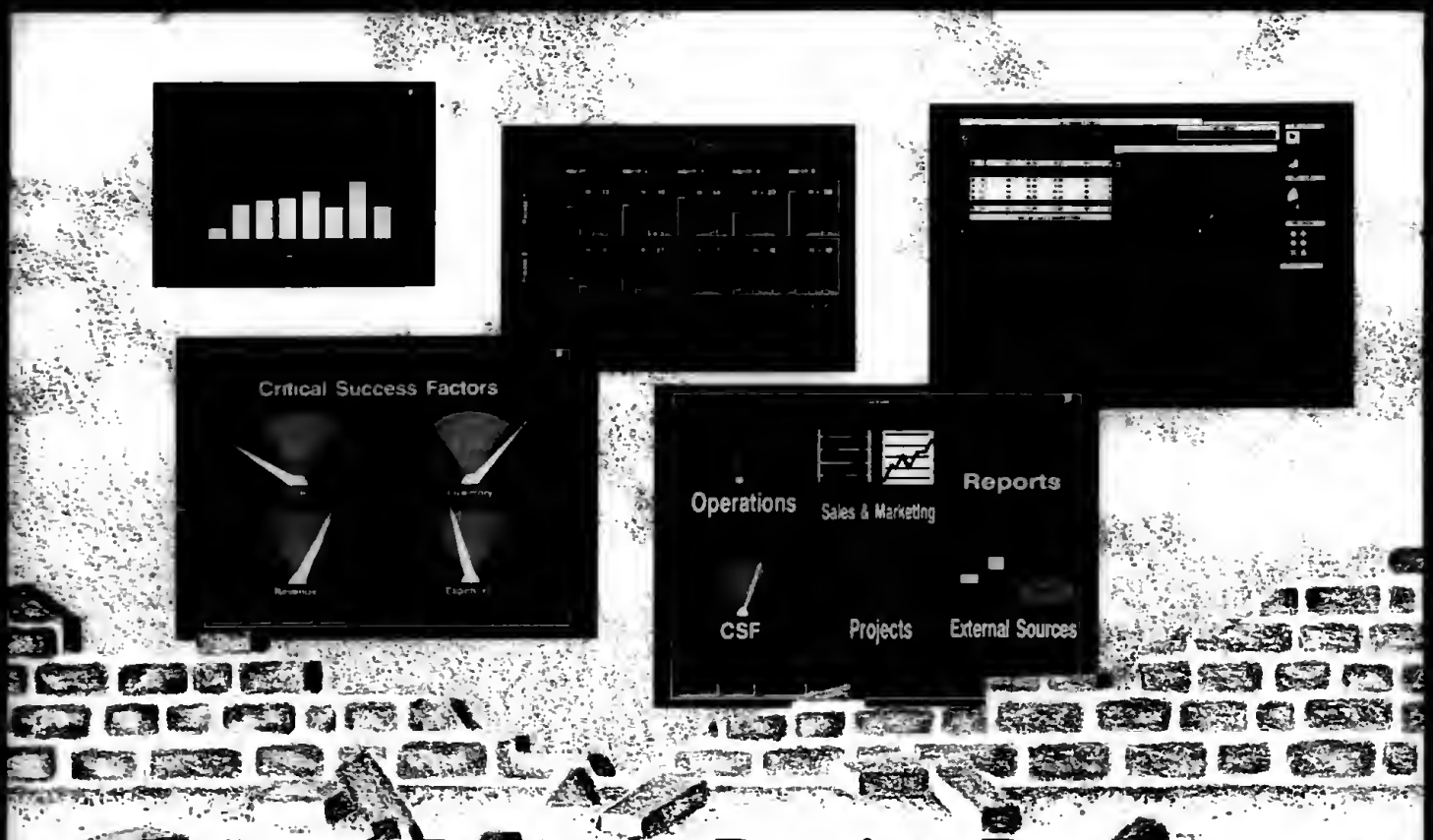
OPEN SYSTEMS '94

A COMPUTERWORLD SPECIAL REPORT

INSIDE

- Exclusive: New X/Open Global Survey
- Open Insecurities
- Hot Hands, Cold Feet: Open Vendors Compared
- ABC's of Open Systems

They're frustrated. They're angry. But one way or another, big users are determined to make systems work together.



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OPEN SYSTEMS '94

LEAD STORY

By Hook or Crook

Despite continued frustration with vendor foot-dragging, large corporate users are pushing ahead with efforts to create interoperable systems that make sense for their firms. Page **107**

INFOGRAPHICS

U.S. Open '94

Exclusive results of X/Open's latest survey of IS and business heads found U.S. firms spend 43 cents of every technology dollar on open systems — up 13 cents from last year. Page **108**

Wide Open World

European organizations are most likely to require or strongly recommend the purchase of open computer products and systems; Japanese the least. Portable operating systems and customer focus are also hot. Page **112**

Real Distributed Computing

BRIAN SMALE

Chase Manhattan, Texaco and Skidmore, Owings & Merrill take different paths to worldwide interoperability. But workable doesn't mean complete, top IS officials say. Page **114**

More Than the $um of Parts

Justifying open systems is a new ball game. Cost may matter less than a project's impact, forcing IS to look for new, nontechnological metrics such as productivity and customer service. Page **115**

HUMOR

A Brief History of Open Systems

With a past like this, no wonder open systems are so schizo. Page **120**

Open Insecurities

As companies expand open systems and networks, more portals of access threaten corporate data. Weak security technology and people problems pose growing threats. Page **121**

PRIMER

ABC's of Open Systems
Basic terms and phrases defined.

Page **110**

COMMENTARIES

Warring Weavers
Charles Babcock: Microsoft and the Object Management Group need to cooperate more on standards so users can continue the vital business of creating object-based enterprise systems.
Page **126**

Speak the Same Language
John Danielsen: Users and vendors must start talking the same language, according to the chairman of the Open Users Recommended Solutions group.
Page **133**

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Beyond blah-blah-blah

Few notions in tech-dom inspire as much blather as "open systems" and its sidekick sensation, client/server.

Despite all the hot air, there's still scant agreement about what "open" means and the best way to get there. Interoperable? Portable? Scalable? Information anywhere? Like pornography, "open" can be readily recognized, if not easily described. And different organizations are seeing different things: "Open" now means standardized and proprietary, old and new, client/server- and host-based, custom and store-bought.

Joseph Maglitta, Editor

That's good. There's a grave danger in letting a small cartel monopolize open or decide where it's going. Consensus, yes; captivity, no.

Open Systems '94 features many voices, including users, analysts, consultants, vendors and user group heads. It also includes exclusive results of X/Open Co.'s latest global survey of 889 top IS and business executives.

Most agree more needs to be said (and done) about open security, systems and network management and standards for Unix and objects, to name a few.

Advice to users and vendors: Make your words count.

Vertical Power

Powerful new open systems groups in manufacturing, petroleum, health care and others are gaining big-name members and clout. Analysts say these new alliances may be shifting the balance of power between vendor and user. Page **123**

Hot Hands, Cold Feet

Vendor commitment to openness ranges from wanna-be to 'yes, indeed,' according to industry analysts. Tops: Hewlett-Packard, Sun Microsystems and Sybase. Page **124**

Spec 1170

This new standard is supposed to put a single face and heart on Unix. However, analysts, vendors and users say only about 60% of the operating system is covered by the new X/Open specs. Some fear continued compatibility problems between different vendors and generations of Unix products. Page **126**

CORPORATE STRATEGY FIRING LINE

Unix Rips . . . NT Trips

As a server operating system, Microsoft's offering shows huge promise for 1996. But experienced IS leaders in several large organizations say Windows NT still lags behind Unix-based systems in performance, cost-effectiveness and worldwide service. Page **130**

Biggest Challenges: 1995

High conversion costs, vendor waffling, fear of Unix and smarter end users will top the agenda next year, according to leaders of the nation's largest open user groups. Page **133**

A Cause For a New Revolution.

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intel inside pentium processor

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By Hook Or Crook

They're frustrated. They're angry. But one way or another, big users are determined to make systems work together.

REX RYSTEDT

If open technology isn't available, Boeing Computer Services' John Sheeran 'gets something that works for us now and hopes for consensus ... in the future.' Sheeran says standards-making 'is a broken process.'

By Alice LaPlante

VENDORS BEWARE: DON'T MESS with Dave Bennett. Or John Sheeran. Certainly not with Ben Chao. Not about open systems. Not if you're claiming to sell an "open" product or service. Absolutely not if you don't want to be shown the door before you've had a chance to uncork your sales pitch.

"Too many vendors are still playing the shell game," complains Bennett, vice president of MIS at Dunkin' Donuts, Inc., a $1.4 billion franchiser in Randolph, Mass. "They talk openness all the way to the point of selling you something they hope will lock you into their product line forever."

Irked by half-filled promises and weary of glacial standards efforts, many chief information officers are deciding that the quickest path to interoperability is the one they blaze themselves.

There's no question that open systems are still viewed as having huge value (see chart page 108). The latest X/Open Co. survey of more than 800 top information systems and business leaders found that 75% considered open products important.

IS spending seems to mirror that belief: Large U.S.-based organizations spend 43 cents of every technology dollar on open products, up from 30 cents last year, the survey found.

The traditional utopian view — a shared industry movement toward universal open computing — is still lauded in theory by most senior technology executives. But most day-to-day efforts have gotten distinctly more personalized.

"Ask a vendor if their system is open and they'll nod enthusiastically," says Chao, director of information services for Kaiser Permanente Health Plan, Inc.'s Colorado region in Denver. "Ask a number of specific questions relating to your particular connectivity and standards requirements, and you'll start to get some real answers."

Even definitions of "open sys-

Hook or crook, *page 109*

PROCUREMENT

"Which standards must your company adhere to when purchasing information technology?"

Specific technologies/products	30%
In-house standards	27%
Government standards	17%
Open systems standards	14%
Industry standards (tie)	14%
XPG standards	1%

SURVEY BASE: 99 U.S. EXECUTIVES
MULTIPLE RESPONSES ALLOWED

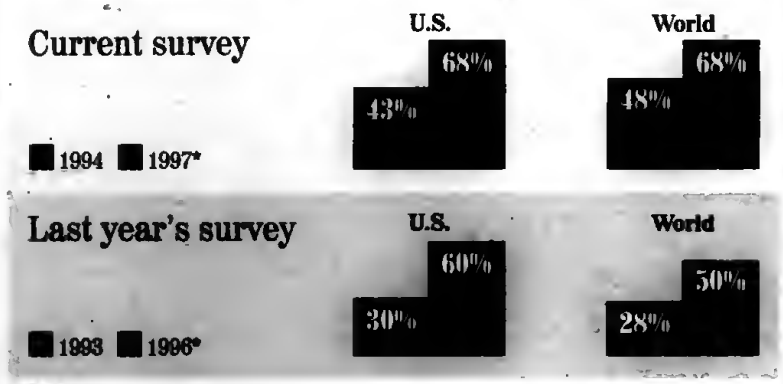
Source: X/Open Co., Reading, England

U.S. OPEN '94

Exclusive results of X/Open's latest survey of 146 U.S. IS and business heads

SPENDING

"What percentage of your IS budget will be spent on open systems?"



*Projected

ANALYSIS

"Massive transformations often take longer than expected. While many of these systems will replace proprietary minicomputers, the sales will come at the expense of Unix and, to a lesser extent, NetWare."

— Tom Kucharvy, President, Summit Strategies

SKILLS

"For new hires, which of the following IS skills or experience are most important?"

Communications skills	29%
Customer service skills	27%
Open systems experience	15%
People management skills	10%
Knowledge of in-house systems	7%

PERCENT OF RESPONDENTS

IMPORTANCE

"How important is interoperability to your organization's future information technology plans?"

Of utmost importance	37%
Very important	38%
Somewhat important	7%
Don't know	3%
NA	15%

PERCENT OF RESPONDENTS

BUSINESS GOALS

"What are your organization's most important objectives over the next three years?"

SPECIFIED TOP CHOICES IN DESCENDING ORDER

1. Operational efficiency
2. Manufacturing
3. Customer focus and service
4. Innovation and development
5. Distribution

ANALYSIS

"It's easy to teach someone the raw technical skills. It's difficult to teach the influencing, the customer service and the communications skills needed to be successful in an open environment."

— Burt Rubenstein, Vice president of technology Cambridge Technology Partners

- Total of 889 respondents from 41 nations: Europe, 44%; industrialized Asia, 24%; U.S., 18%; rest of world, 14%
- Average revenue: $1.3 billion
- Average IS budget: $24 million
- Senior business executives, 14%; IS executives, 55%; IS technical support, 20%; consultants/advisers, 5%; other, 3%; NA, 3%
- Twenty-one-page questionnaire mailed between March and June 1994

All results shown above are from 146 U.S. respondents, unless otherwise noted.

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30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19 Chief Information Officer/Vice President/ Asst. VP* IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

60 Information Centers/Libraries, Educators, Journalists, Students
80 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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80 Manufacturer of Computers, Computer Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

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21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

60 Information Centers/Libraries, Educators, Journalists, Students
80 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

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(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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KEY TOOLS

"What are the most important technologies supporting business goals?

Portable operating systems	82%
Client/server applications	79%
Systems and network security	78%
Integrated network management tools	71%
Integrated systems management tools	66%

PERCENT OF RESPONDENTS
MULTIPLE RESPONSES ALLOWED

ANALYSIS

"The natural market process runs counter to the open standard process. Vendors introduce new products because they are different from existing ones and then let the market decide on their value. They do not introduce new products simply because they conform to standards."

— Hugh Ryan, Managing director Andersen Consulting's New Age Systems practice

FAST RISERS

"What technologies will you begin using by 1997?"

Integrated systems management tools	45%
Database management tools	44%
Integrated network management tools	41%
Distributed databases	39%
Distributed computing tools	39%
CORBA/OLE (tie)	26%

PERCENT OF RESPONDENTS
MULTIPLE RESPONSES ALLOWED

BY HOOK OR CROOK

CONTINUED FROM PAGE 107

▲ *Kaiser Permanente's Bill Saunders: Sites suffer 'too much data redundancy because . . . systems don't talk to each other'*

tems" differ among IS leaders. Some describe it as universal data access. Others see it as seamless integration among different vendors' systems.

Notably absent is the "does 'open' mean Unix?" wrangling prevalent in the late 1980s. "Open systems is *not* about operating systems, and it's not about hardware independence alone," Bennett declares. "Anyone who persists in hanging on to those definitions is asking for trouble."

The sky's the limit

Today, many CIOs seem less hung up on whether a system or product is "open" in the purest sense than on whether products provide flexibility and vendor independence. The new cry seems to be "Don't fence me in."

"When CIOs talk about openness today, they primarily are talking about not limiting their future choices," says Bob Walsh, principal at consulting firm The Practice Corp. in Mansfield, Mass.

The reasons are purely pragmatic: CIOs grouse that standards groups such as the Open Software Foundation, the International Standards Organization (ISO), X/Open and the American National Standards Institute (ANSI) can easily get mired in red tape and drawn-out bureaucratic processes.

The ultimate benefit of many initiatives, such as the so-called Spec 1170 effort to unify Unix, is far from clear (see story page 126).

"It's a broken process," says Sheeran, manager of architecture and standards at Seattle-based Boeing Computer Services Co.'s research and technology group.

Like many others, Sheeran criticizes standards efforts for failing to set deadlines or concrete schedules for vendors. No wonder "mini-consortia," in which five or six companies band together to agree on a simple application programming interface or to solve a particular open problem, are becoming popular, he says.

Even then, technology chiefs say, long-awaited products, interfaces or communications often ship late or are filled with bugs and glitches. Security and cross-platform management tools are considered especially weak (see story page 121).

Moreover, many users marvel that vendors employ quality standards their own firms wouldn't dare use. "[Boeing's] commercial airplane division will be delivering our new Model 0007 aircraft in June 1995 that will be essentially defect-free," Sheeran says. "Our customers do not expect to fly that plane for a year before they are confident they can't shake it down."

Mix and match common

"Of course we can't get everything in the open systems world to talk to everything else," says Jack Donahue, assistant controller at MIT in Cambridge, Mass.

Donahue's situation is frustratingly familiar. MIT's technology infrastructure supports a web of hardware and software architectures, including an IBM VM mainframe, DOS and Windows-based PCs, Macintoshes and Unix workstations.

The obvious solution seemed to be open systems. So MIT embarked on an ambitious retooling of host applications to client/server mode. Modules are supposed to be accessible by users, regardless of hardware. Donahue says the school purchased tools from a number of so-called "open" vendors in hopes of creating interconnectivity between academic and administrative users.

Unfortunately, Unix workstations still have a problem connecting to databases, Donahue says. He blames a missing product from a key supplier. "We're absolutely dependent on the vendor who has promised to deliver it to us," he complains.

Hook or crook, *page 110*

BY HOOK OR CROOK

CONTINUED FROM PAGE 109

Unfortunately, such experiences are common. Kaiser Permanente's Chao also feels thwarted. He tells of efforts to make Kaiser clinical data available to independent laboratories, clinics, pharmacies and other health maintenance organizations (HMO).

"Here we are, requesting all our vendors to develop standard interfaces so that eventually we will have a truly open system," he says. "At the same time, we find them selling proprietary versions of their software to the very organizations we'll eventually need to connect with. It's very frustrating."

Indeed, industry analysts say major vendors show varying degrees of seriousness about providing open systems products (see chart page 124).

New attitude

So what's a CIO to do? Take matters into his own hands by determining what is acceptably open to him. Bennett calls it "consumerization" of open systems. The attitude: "You had your chance. Now we do it my way."

This aggressive, individualistic attitude is typified by Sheeran. He's piecing together an ambitious open systems architecture in Boeing's commercial airplane group to eventually unite Intel Corp., Unix and Macintosh computers — a total of 80,000 desktop devices.

Sheeran aims to provide users with seamless access to data and applications residing on multiple host and server systems serving The Boeing Co., the $30 billion airplane manufacturing parent.

The must-haves

However, before he will buy a product or technology, Sheeran makes sure it fulfills these five distinct requirements:

- Suitability for "portable people" — workers whose technology skills are independent of training they receive on a particular hardware or software product.
- Software portability across Boeing's varied hardware platforms.
- Data transfer across dissimilar systems.
- Interoperability of disparate systems.
- An integrated computer-aided software engineering environment that will let Boeing design applications in discrete, reusable modules. This permits seamless integration with other applications, regardless of original platform or architecture.

These tough guidelines don't mean that Boeing has given up on standards, however. Sheeran says he works actively with other large corporate users in hopes of getting vendors and standards makers to agree on important specifications.

Yet even industry pressure isn't enough. Case in point: Boeing has been repeatedly stymied in a three-year attempt to get an open repository standard defined, Sheeran says.

"We've put a major effort into this, yet we cannot get closure or commitment from the industry," he says. "We're supporting all negotiations between ANSI, ISO and ECMA." The short-term solution: installing a proprietary repository to work with existing architecture.

Kaiser Permanente's Chao has also had to be adaptable. Many of the technologies faced by the $8.1 billion HMO would not traditionally be described as "open."

For example, IBM's DB2 serves as a back-end data repository; OS/2 runs on client machines. A Sybase, Inc. relational database on IBM RS/6000 Unix servers will connect host and client machines via the TCP/IP networking protocol.

"We know individual Kaiser sites are dealing with too much data redundancy because these systems don't talk to each other," says Bill Saunders, Kaiser's manager of interregional common systems. His Portland, Ore., group develops common administrative applications for the various Kaiser operating regions, including Chao's. "We're working on it, but it's going to take time."

ANDY FREEBERG

▲ *Wells Fargo's Tsvi Gal: 'Patience, careful planning and continuous monitoring' help create an open environment that links 'islands of infrastructure' at the $52 billion bank*

Careful planning

San Francisco-based Wells Fargo & Co. is also trying to be patient. Technology and cost constraints have forced the bank to build what Vice President of Information Technology Tsvi Gal calls "islands of infrastructure."

Gal says the $52.5 billion bank hopes its extreme care in design and implementation will eventually melt these islands into a single entity, heading toward a globally open environment. "The key is patience, careful planning and continuous monitoring of progress so that we don't lose sight of this goal."

Increasingly, the answer seems to lie in a three-tiered architecture that involves "middleware" — an application-cum-communications layer that acts as a buffer between proprietary legacy systems, so-called "open" database servers

Hook or crook, *page 112*

the ABC's of Open Systems

Client: The requester program in a client/server computing architecture.

Client/server computing: A type of processing in which a client requests a service or information from a server that performs the service and/or returns the requested information to the client.

Cooperative processing: A type of distributed processing in which processing, storage, control or I/O functions are allocated among interconnected processors, each cooperating synchronously to perform the total task.

Distributed processing: A type of computing in which processing, storage, control and/or I/O functions are allocated among interconnected processors.

Floating license: A type of software license whereby the software product is not tied to a specific CPU or site.

Object-oriented software: Software built using libraries of reusable, extensible and configurable software modules.

Peer-to-peer computing: A type of distributed processing with no distinction between nodes as to roles or services performed. Program control is at each node, and management of shared resources is distributed to all nodes equally (see also "distributed processing").

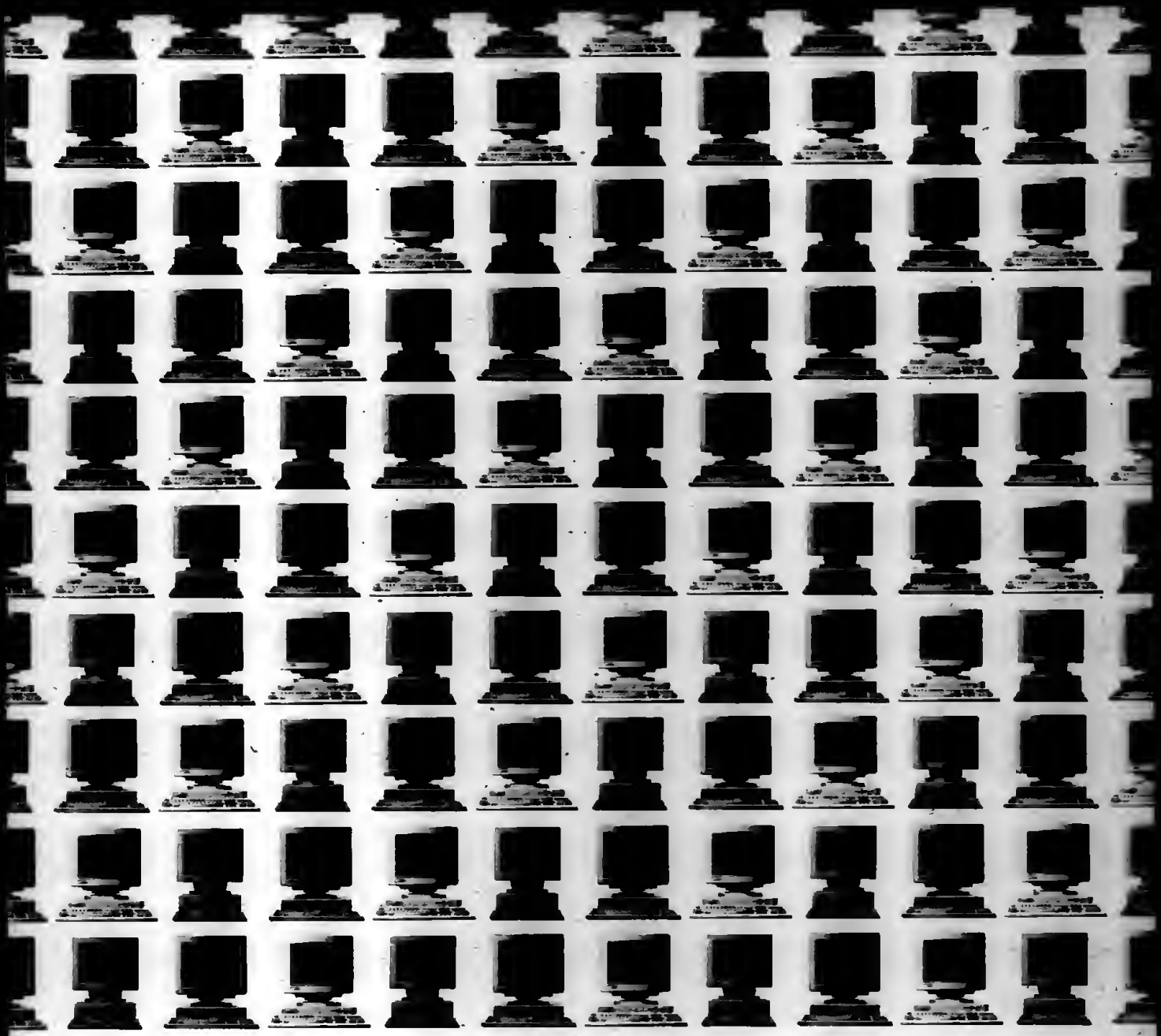
Server: A computer and/or program that accepts, controls and executes requests for processing or data access from other computers and/or client programs in a network.

Standards: Agreed-on aspects of software design, interfaces, interoperability and compatibility as determined and maintained by recognized, supplier-independent, professional, industrial or trade organizations or governmental bodies.

Usage-based license: A type of software license with charges based on a measure of resource use.

Source: "Software Licensing Lexicon," International Data Corp., Framingham, Mass.

STEVEN GUARNACCIA



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BY HOOK OR CROOK

CONTINUED FROM PAGE t10

and desktop clients.

Jim Johnson, chairman of The Standish Group, an open systems consulting firm in Dennis, Mass., says one view of open systems nirvana can be summarized as "when your technology investments don't inhibit you from moving ahead with better solutions as they become available." If that's true, he says, then a modular middleware approach makes perfect sense.

"Middleware is very attractive to corporations committed to open systems because it allows them to move incrementally toward a solution that might not be possible today," agrees The Practice Corp.'s Walsh. "It also does away with the false notion that by holding on to some proprietary legacy systems, you are somehow less than pure and that your commitment to open systems is 'soiled' in some way," he adds.

Other signs of hope loom. Bennett is particularly enthused that Novell, Inc. formally handed the term "Unix" to X/Open.

"Finally, we have this very important trade name belonging to a public forum," he says. He adds that he hopes the hand-off may make it easier to gauge a vendor's claims of openness, as X/Open will require that a product conform to certain interface definitions before the Unix brand-name can be used.

"This is a very good thing for consumers," Bennett concludes. He explains that the move will allow CIOs to move quickly when the next great new technology appears down the road.

> **"Too many vendors are still playing the shell game."**
>
> *—Dave Bennett, Vice president of MIS Dunkin' Donuts, Inc.*

At Boeing, Sheeran says it's already assumed that systems will be defined and executed on multiple platforms and that data could reside on a third type of platform if needed.

If a key technology isn't yet available, as in the case of a data repository, Boeing "gets something that works for us now and hopes for a consensus on openness in the future," he says. □

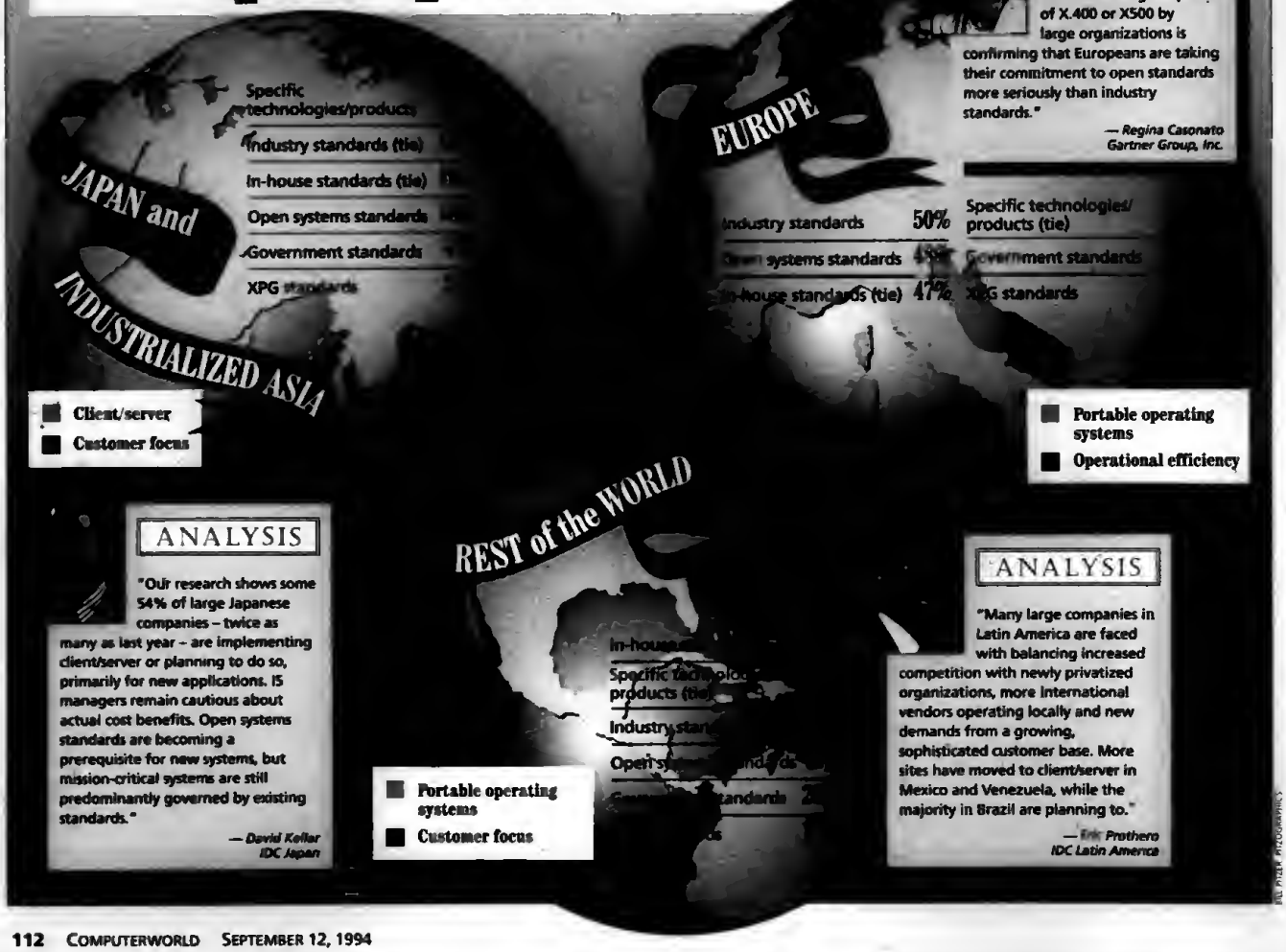
LaPlante is a free-lance writer in Woodside, Calif.

WIDE OPEN WORLD

European organizations are most likely to require or strongly recommend the purchase of open computer products and systems; Japanese organizations the least

Responses to the question: "Your organization's procurement policy requires that products conform to which of the following standards?" (MULTIPLE RESPONSES PERMITTED)

Top technology | Top business objective



ANALYSIS

"The increasing adoption of X.400 or X500 by large organizations is confirming that Europeans are taking their commitment to open standards more seriously than industry standards."

— Regina Casonato, Gartner Group, Inc.

ANALYSIS

"Our research shows some 54% of large Japanese companies – twice as many as last year – are implementing client/server or planning to do so, primarily for new applications. IS managers remain cautious about actual cost benefits. Open systems standards are becoming a prerequisite for new systems, but mission-critical systems are still predominantly governed by existing standards."

— David Kellar, IDC Japan

ANALYSIS

"Many large companies in Latin America are faced with balancing increased competition with newly privatized organizations, more International vendors operating locally and new demands from a growing, sophisticated customer base. More sites have moved to client/server in Mexico and Venezuela, while the majority in Brazil are planning to."

— Eric Prothero, IDC Latin America

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REAL DISTRIBUTED COMPUTING

Everyone talks about it. Here's how Chase, Texaco and Skidmore, Owings & Merrill are doing it worldwide.

By Jean S. Bozman

WHEN MICHAEL ZEITLIN RUNS out of computing power on his desktop workstation at Texaco, Inc. in Houston, he simply dials another Texaco computer in London to get some more. Across the city, at Skidmore, Owings & Merrill's London offices, a stream of electronic mail and financial data flows day and night to the Chicago headquarters of the $70 million architectural firm.

Despite grandiose plans, few organizations have made interoperability a key part of their data centers or enterprise networks. In most companies, pockets of open systems are the rule. Not surprisingly, few are pleased with the payoffs (see chart below).

Yet a number of global firms have succeeded in gluing together personalized approaches to open systems. True, some require stopgap measures, such as using compatible relational databases to communicate with proprietary mainframes and Unix servers. But company officials say the approaches work, provided they are willing to bear the steep migration costs and learning curves required by open systems.

Chase Manhattan: Broadly open

"We're not waiting for the walls to come down. We're pushing on the walls, finding ways around them and building over them," declares Gene Friedman, vice president of applied technology at The Chase Manhattan Bank NA in New York.

The $3.8 billion bank's operations span the world. Because its largest customers are also global, Chase wanted to present one face around the world, Friedman says.

So it decided to jump-start the push to open systems by defining standard technologies within the company — regardless of whether they were industry or Unix standards. Choices included off-the-shelf multiplatform software, such as Lotus Development Corp.'s Notes and Novell, Inc.'s NetWare for PC LANs.

The approach reflects the pragmatic view of Chief Information Officer Craig D. Goldman. In his view, open means a "ubiquitous" market standard, with abundant software and support. That's why Microsoft Corp., Novell, Sun Microsystems, Inc. and AT&T Global Information Solutions are part of Chase's open systems mix, he explains.

In 1988, Chase's open efforts began in earnest. But off-the-shelf systems management and security software packages were even scarcer than they are today. So the bank's information systems department had to cobble together its own software infrastructure.

"We were often riding down a road that didn't have a road map," Goldman recalls.

Major concerns included seamless access, reliability and cost.

BRIAN SMALE

▲ *Chase's Gene Friedman and Craig D. Goldman wanted to present 'one face' to global customers*

"We couldn't just throw a blank piece of paper out there and automate the environment," says Jonathan Vaughan, Chase vice president of application systems technology, "because the new systems had to integrate with the existing ones."

But efforts continued. Today, corporate standard Sybase, Inc. databases tap into IBM DB2 mainframe cousins and send copies of data to other Sybase databases on Unix servers and IBM OS/2 servers worldwide.

Lacking off-the-shelf solutions, Chase wrote custom code for systems management and security.

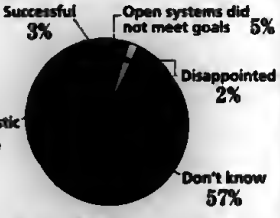
Chase officials say openness has paid off in several ways. For starters, they claim distributed computing has created more and better data for more than 20,000 company PC users.

Moreover, the company says programmer productivity is running 30% higher on dedicated workstations than it did on time-sharing mainframe terminals.

Vaughan says one trial analysis of data on a massively parallel NCR 3600 Unix machine

PAYOFFS: JURY STILL OUT

Only a tiny fraction of large companies say their open systems strategies are delivering results. More than half are still undecided



Survey base: 100 large U.S. companies

Source: The Yankee Group, Boston

took 70 minutes instead of the usual 70 hours.

And though banking is information-intensive, Chase says it's been able to trim IS staff to 3,000, down 300 from several years ago.

To keep development moving, the firm says it often reinvests savings from open systems into new open technology. Goldman's annual IS budget has risen from $548 million in 1992 to nearly $600 million this year.

Goldman explains, "You're not going to be slashing, slashing, slashing [IS budgets and personnel] if there is value added."

Texaco: Standard formats

The hope of cost savings is one great lure of open systems. That's the case at Texaco: The $34 billion firm believes it can leverage open architecture into a better bottom line.

Don Bennett, general manager at Texaco's information technology department, says he hopes to slash the high cost of developing and maintaining software for proprietary mainframes and minicomputers.

His plan? "Use standard formats," along with packaged and portable software that puts best of breed products on existing hardware.

Like Chase, Texaco is keen on maximizing computing resources. Its global open systems network allows users on both sides of the Atlantic to use idle computers, regardless of location.

"At any given time, there are always CPUs available," explains Zeitlin, team leader for visualization of seismic and exploration data. "So while the people in London are sleeping, we're computing."

The company won't talk details but says that mixing Unix with open systems and networks has cut costs at its exploration and production technology department. Now, the challenge is to transplant the knowledge to the parent company's financial and accounting operations, which run on IBM mainframes and Windows PCs.

Some users are already trying Microsoft's Windows NT and using software based on The X Consortium's X Window System standards to link into Unix servers.

Ultimately, Texaco says, it will likely unite Unix and proprietary systems via database-to-database links throughout the company.

"We intend to have the most cost-competitive combination of those two architectures," Bennett says.

Skidmore: One vendor

Skidmore, Owings & Merrill has chosen a third, seemingly odd path to interoperability: sticking with one vendor — IBM.

"We want to make the computer aspect [of our work] as simple as possible," explains Tom Fridstein, Skidmore's managing partner in Chicago.

To that end, Skidmore locations on both sides of the Atlantic have the same combination of IBM AS/400 and RS/6000 Unix workstations, says James Whitehouse, head of business development in London.

Officials say the entire corporation "lives" on the enterprise network — and can share data as needed. Unix workstations can be easily rearranged as new client projects arise worldwide.

> "We're not waiting for the walls to come down. We're pushing on the walls, finding ways around them and building over them."
>
> *—Gene Friedman*
> *Vice President*
> *Chase Manhattan Bank*

For example, a project in Berlin two years ago got off to a quick start because the German client already had RS/6000 workstations.

U.S. architects brought along their hard-drive memory units and software from Chicago — and shipped over several more RS/6000s. The result: The data formats used to store two-dimensional and 3-D renderings were identical.

While the system works, transfer methods between the two IBM systems are still somewhat cumbersome, acknowledges computer-aided design manager Caron Stein.

Data from the RS/6000s is placed in an Ingres Corp. database. It's then loaded into an electronic report for access by the AS/400.

However, a more elegant method may be on the horizon: Last month, IBM promised users it would make the two systems more compatible by using common PowerPC chips.

Like other organizations with open systems and packaged software, Skidmore's IS staffing is minimal. The 80 programmers who designed Skidmore's Architectural and Engineering series left after the 1980s project was completed. Today, there are only 25 IS staff members. □

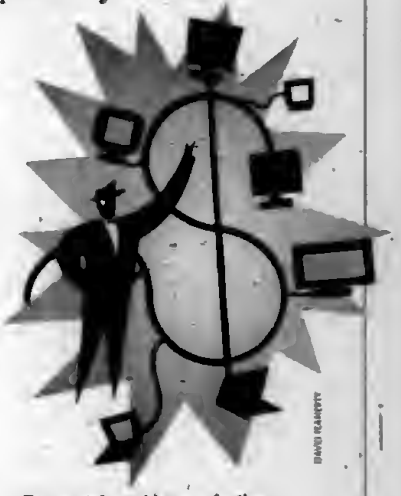
Bozman is *Computerworld*'s senior editor, Open Systems.

More Than the $um Of Parts

By Alan R. Earls

INSTEAD OF A TECHNOLOGICAL magic carpet ride, many IS leaders are discovering that open systems can feel more like a bumpy (and expensive) camel journey through a strange land.

Like Scheherazade — the fabled Arabian Nights courtesan whose life was spared only when she con-



DAVID RANDOFF

cocted an entertaining story for her master — information systems leaders are groping for new ways to make open systems make sense to corporate bosses.

While it's no simple trick to show payback on any new computer system, front-line users and analysts say justifying open systems is a new ball game.

"It's been at least 20 years since anyone in IS has had to learn anything really new," says Peter Briggs, a former Digital Equipment Corp. technical director who now works as a consultant in Stow, Mass. "That's why [open systems and justification] is such a challenge."

Spare the expense

For starters, cost may matter less than a project's impact. That can force IS people to look beyond their traditional means of justification to consider the wider corporate impact of open systems.

"We don't believe people are adopting client/server to save money," says Richard Buchanan, senior analyst at Forrester Research, Inc. in Cambridge, Mass. "Most of the research we do shows that things like client/server are more expensive than mainframes."

> **Justifying open systems is a new ball game.**

Forrester estimates that developing a typical new custom client/server application for 140 users costs about $2.15 million. That compares with a four-year cost of about $2 million for the same application based on an IBM AS/400, the consultancy says.

Even if the price tag for a second client/server application drops nearly in half, it's still hardly cheap (see chart next page), Buchanan notes.

Fortunately, evidence of other benefits can speak louder than strict return-on-investment analysis.

"With client/server there is more of a focus on end-user productivity," says Paul Ratner, vice president for IS at Metropolitan Life Insurance Co. in Parsippany, N.J. "You've got to include significant work-flow changes if you are going to reap the benefits," he adds.

So Ratner says he sells open projects at the 65,000-employee firm by focusing on improved user and system performance.

Though Met Life has taken some steps along the open road, Ratner says, "we're still basically an IBM mainframe shop. So when something new is needed, additions to the existing system are looked at first."

A basic cost/benefit analysis is done. Then, he explains, "if you

Sum of parts, *page 116*

MORE THAN THE $UM OF PARTS

CONTINUED FROM PAGE 115

can show a significant increase in productivity or quality by off-loading the mainframe, then you can justify things like client/server, even if it is expensive."

Strategic justification

At People's Bank, Inc. in Bridgeport, Conn., linking a new open systems project to a key corporate goal — top-notch customer service — provided sufficient justification.

"Our telephone-based banking services are very important to us," explains John Sobolewski, vice president for strategic IS at the $6.1 billion bank. "But we found that customers often had to spend several minutes waiting for us to get them answers."

So he decided the best way to speed response was to create a client/server front end for a tired legacy system and supply customer service staffers with new PCs.

Though the price was high (he declined to specify an amount), Sobolewski says he was able to demonstrate a 60% to 80% decrease in customer response time. And that, he says, was enough.

Sometimes, open client/server systems virtually justify themselves.

Take Conseco, Inc. The $13 billion insurance holding company went looking for new applications to support its fast-growing business.

The Carmel, Ind., firm quickly discovered that the best packages in the industry were available only on client/server, says Brian Gunnell, second vice president for data processing.

Although Conseco has spent about $1 million a year for new systems over the past three years, Gunnell says he's rarely done much formal cost justification.

"We've grown from 300 to 1,100 employees in just four years," he says, "[so] it has been critical to demonstrate that we are fast and that we are flexible."

Uncompelling evidence

Even when they are justified, open systems or client/server aren't no-brainers.

Joseph E. Hunter Jr., IS manager at Baltimore Gas & Electric (BG&E), says his utility remains unconvinced that open systems are compelling in either cost or benefits.

Hunter says he relies heavily on his computer architecture and planning group to evaluate current technology and set future directions. So far, open systems have been coming up short.

For now, BG&E uses open systems to fill in computing holes. In one case, Oracle Corp.'s relational manager has become the database of choice.

Still, he concludes: "Everyone is going toward that direction, but we certainly won't be an open shop tomorrow."

Similarly, at Atlanta Gas Light Co., open and client/server systems aren't automatically chosen just because a good case can be made for them, according to Bill O'Neal, vice president for IS.

"Although client/server has been our main thrust in the open area, as we identify and develop applications we still look for the best platform to meet user needs," he says.

With hundreds of PCs connected throughout the service area by LANs and WANs, mainframes have been relegated to serving largely as data repositories.

"We've been looking for truly open solutions for years," O'Neal says, "but it has been our opinion that they don't really exist — and they won't until all the vendors get talking."

Client/server as needed

In the meantime, client/server gets justified and applied on an as-appropriate basis, according to O'Neal.

And, notes Edward Bucnis, vice president of operations at People's Bank, even when you succeed in making a case for open systems, it can be a mixed blessing.

Most, Buenis says, aren't really "production grade" anyway. Thanks to various bugs and other surprises, "you find that you are stuck at being about 95% there," he grouses.

For companies that have decided open is worth justifying, consultant Briggs advises IS leaders to relate open systems and client/server solutions to overall business processes. He suggests breaking down everything your organization does into its smallest, "atomic-level" units, then designing solutions around them.

"If you do that, things like client/server make even more sense because they are scaled most accurately to the problems you face," he says. □

Earls is a free-lance writer based in Franklin, Mass.

DATA DOLLARS

"How much of your IS budget goes to data management?"

Less than 20%	54%
20%–39%	22%
40%–59%	5%
60%–80%	4%
More than 80%	1%
Don't know	14%

SURVEY BASE: 146 U.S. EXECUTIVES

Source: X/Open Co., Reading, England

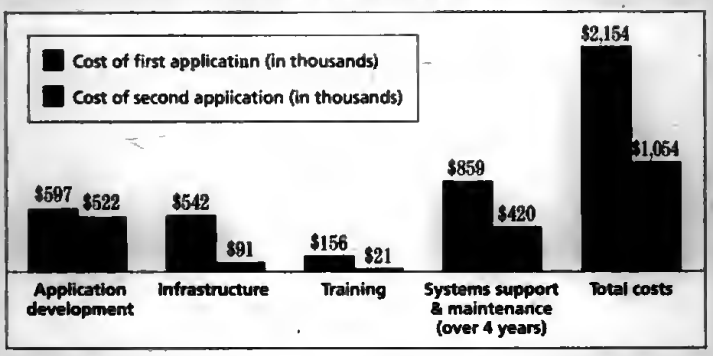
ANALYSIS

"Over the next few years, as hardware prices continue to decline and as systems become easier to manage and support, the proportion of information technology budgets devoted to data management is likely to increase as hardware continues to represent a declining share of information technology budgets."

— Michael Goulde, Patricia Seybold Group

CHEAPER THE SECOND TIME

Client/server's price tag drops by as much as 50% after the initial application



Source: Forrester Research, Inc., Cambridge, Mass.

ANALYSIS

"These numbers will continue to move toward negotiated or enterprise contracts. It's in the interest of both users — especially corporate users — and vendors to have realistic and fair licensing agreements that can and will be adhered to properly."

— John Mann, The Yankee Group

LICENSING

"What percentage of your software is licensed?"

Negotiated contracts:		Shrink-wrap agreements:	
Less than 20%	22%	Less than 20%	16%
20%–39%	10%	20%–39%	17%
40%–59%	17%	40%–59%	19%
60%–80%	18%	60%–80%	9%
More than 80%	20%	More than 80%	22%
Don't know	13%	Don't know	17%

SURVEY BASE: 146 U.S. EXECUTIVES

Source: X/Open Co., Reading, England

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†U.S. list prices effective 7/1/94. *U.S. list price for HP NetServer 4/66 LM Model 1 including 66-MHz Intel486 DX2, 16-MB RAM. **U.S. list price for HP NetServer 4/66 LF Model 1 including 66-MHz Intel486 DX2, 8-MB RAM. ***U.S. list price for HP NetServer 4/66 LC Model 1 including 66-MHz Intel486 DX2 and 8-MB RAM. Prices subject to change without notice. Intel486 DX2, 1DX4 and Pentium are trademarks of Intel Corporation and the Intel Inside and Pentium Processor logos are registered trademarks of Intel Corporation. ©1994 Hewlett-Packard Company PPG495

intel inside

HP NetServer LM • 90- and 66-MHz Intel Pentium™ processor, 66-MHz Intel486™ DX2 processor • Dual Intel Pentium 66-MHz Symmetric Multiprocessing (SMP) • Optional internal hot swap disk array (RAID 0, 1, 5, 6) and ECC memory • HP NetServer Assistant 2.0 included • 16-MB RAM standard, 384-MB maximum • Up to 256-KB write-back cache • 9 mass storage shelves • 8 EISA bus-master I/O slots • Integrated EISA Fast SCSI-2, IDE and video controllers • Designed-in security, serviceability, and cooling features • Tested and certified on all major network operating systems

HP NetServer LF • 66-MHz Intel Pentium processor, 100-MHz IntelDX4 processor, 66-MHz Intel486 DX2 processor • Automatic Server Restart • HP NetServer Assistant 2.0 included • Optional internal hot swap disk array (RAID 0, 1, 5, 6) • 8-MB and 16-MB RAM standard, 192-MB maximum • 256-KB write-back cache • 9 mass storage shelves • 2 PCI, 7 EISA bus-master I/O slots • Integrated EISA Fast SCSI-2, IDE and video controllers • Designed-in security, serviceability, and cooling features • Tested and certified on all major network operating systems

HP NetServer LC • 66-MHz Intel Pentium processor, 100-MHz IntelDX4 processor, 66-MHz Intel486 DX2 processor • Automatic Server Restart • 8-MB and 16-MB RAM standard, 192-MB maximum • Up to 256-KB write-back cache • 1 PCI, 1 PCI/EISA-combo, 4 EISA I/O slots • 5 mass storage shelves • Integrated EISA Fast SCSI-2, IDE and video controllers • Designed-in security, serviceability, and cooling features • Tested and certified on all major network operating systems

Management Solutions: HP Remote Assistant • $999† for intelligent EISA card and software • Complete remote control of server • Continual environmental and server hardware monitoring and error logging • Automatic Server Restart • Works on all major network management environments **HP NetServer Assistant 2.0** • Included with HP NetServer LM and LF; $495† option for HP NetServer LC • A customizable server management software tool set • Proactive system/component alerting and status information • Includes HP OpenView 7.1 • Comprehensive troubleshooting tools

HP Service and Support • A full range of support service from HP or HP-authorized resellers • Three-year, on-site, next-business-day limited warranty standard on all products, affordable upgrades to same-business-day or 24-hour, 7-day, 4-hour response • Complete technical and support information available through a wide range of media HP Support Assistant CD-ROM subscription, fax-back service; BBS, CompuServe forum and telephone support

HP NetServer LM from $4,449*

HP NetServer LF from $3,249**

HP NetServer LC from $2,529***

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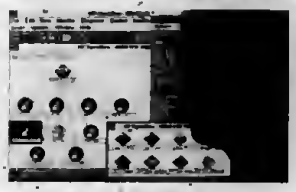
HP NetServers are easy to manage even when you're not there.

With today's increasingly complex networks, it seems LAN managers depend more on their beepers and the corporate travel office than anything else. Go here, go there, fix this, fix that. Leaving no time for the kind of proactive work that could avert trouble in the first place.

Maybe that's why so many network administrators are turning to the affordably priced lineup of HP NetServers. Take a quick look, and you'll find optimized price/performance servers to match every need. But you'll also discover how to answer your need for servers that are easier to manage.



With HP NetServer Assistant 2.0 you get - intuitive viewing of your network, comprehensive diagnostics plus local and remote management all in one package

HP NetServer Assistant software helps you prevent problems before they occur—and gives you tools to resolve them if they do. And because it supports the HP OpenView platform, you can access your entire network from a single console. With HP Remote Assistant, you can manage the server from anywhere, even if it's down. Even if the network's down.

Performance? You can choose from single and dual Pentium™ models, as well as those with Intel486™ DX2 and DX4 processors. For compute-intensive applications, you'll want to look at the HP dual Pentium Symmetric Multiprocessing model. Whatever you select, you'll enjoy maximized uptime, thanks to RAID-based fault tolerance, hot swappable drive replacement and error checking and correcting memory.

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DANIEL VASSDINCHUQS

c. 20,000 B.C.
Unidentified cave dwellers develop rudimentary version of commonly understood human language. Unfortunately, effort dies in ANSI standards committee.

8,000 B.C. - A.D. 1,000
Languages proliferate around the world, creating demand for automated translation device. But scholars argue that you will need at least a 486 to do that.

c. 4,000 B.C.
Sumerians develop sophisticated form of written communication using pictographic illustrations of basic human activities. Thus, assembly language programming is born.

Sept. 24, 1038
Dark Ages end, although concept of a period in history devoid of invention or intellectual achievement will continue to be used by Microsoft to describe the world before Windows.

1215
King John signs the Magna Carta, granting privileges to nobles and the church, guaranteeing trial by jury and abolishing the death penalty for people who form computer industry consortia.

1452
Johannes Gutenberg develops first printing press using movable type. Technology, in theory, allows any idiot to publish any fool thing he wants — sort of like the Internet.

1789
First open systems movement begins as downtrodden French peasantry (Unix zealots) overthrow swaggering, arrogant monarch (IBM) and set up a government that is much less effective than the one it replaces (Corporation for Open Systems).

1876
Alexander Graham Bell invents Call Waiting and later the telephone, which will be crucial to the deployment of open systems. His assistant, Dr. Watson, conducts first experiment in digital communications by holding the handset close to his face and yelling, "101100010111100101001010" into the mouthpiece.

1890
Herman Hollerith's mechanical computer is used by the government to compute the census. Machine fails at a crucial point in the counting process, prompting Hollerith to promise that everything will run much smoother in the next release, which is going into beta.

1944
Harvard University unveils Mark IV, the world's first electromechanical computer. The machine is rushed into service to break highly complex German cryptographic messages, a capability programmers later employ trying to decode Berkeley Unix documentation.

1969
AT&T Bell Labs scientists design an operating system as a joke for a departing buddy. Knowing the project will never amount to anything, the pranksters name it after a castrated Oriental harem attendant, build in goofy commands like "grep" and "troff" and fill it so full of security holes that no reasonable commercial enterprise would ever consider it. Hey, stop! Ha, ha, ha, ha! This is too funny! You're killin' me!

1969
IBM reluctantly unbundles software from hardware, effectively handing the computer industry over to a pimply 15-year-old kid from Seattle.

1988
Young Cornell University student Robert T. Morris demonstrates the security weaknesses of the Internet by circulating a "worm" program that disables thousands of connected computers. Morris is convicted of the crime and, as punishment, is forced to consider six-figure job offers from industry companies.

1988
As a demonstration of the intense spirit of unity in the open systems community against the tyranny of proprietary systems suppliers, Unix vendors split into two angry, vindictive camps.

1991
Someone invents the term "client/server." Advertising industry breathes a huge sigh of relief.

1991
In a powerful statement of its commitment to compete in the brutal, low-margin open systems business, IBM offers its best employees up to two years' pay if they leave the company.

1993
Microsoft introduces Windows NT.

1993
The Internet Engineering Task Force announces that the world is running out of Internet addresses and that from now on, all devices on the Internet will have to include a nine-digit ZIP code.

1994
As a demonstration of the intense spirit of unity in the open systems community against the tyranny of being stomped into tapioca pudding by Windows NT, two angry, vindictive camps of Unix vendors get back together.

September 1994
39-year-old Sun CEO Scott McNealy gets married, proving that even the most open system can be taken proprietary under the right circumstances. □

Gillin is *Computerworld*'s editor.

If hobbled technology doesn't screw things up, people will

OPEN INSECURITIES

By Rochelle Garner

RECON OPTICAL NEVER WORRIED about security. Its engineers were too preoccupied with developing some of the most advanced optics technology of the mid-1980s, not with protecting that data. Unfortunately, a foreign customer was equally preoccupied with stealing Recon's information.

So from 1986 to 1988, this on-site customer systematically delved into the Barrington, Ill., company's computer system, rifled through engineers' papers and plundered Recon's trade secrets.

Recon's losses were catastrophic. Forced to lay off 800 of its 1,100-person staff, Recon — with offices gutted and parking lot empty — today is locked in a court battle with its onetime customer turned competitor.

Security quagmire

Unfortunately, as more companies move to the nirvana of open systems, experts say corporate data will become even less secure. Blame it on distributed systems, the architecture that helps satisfy the open systems mantra of "information anywhere."

"The greater the number of network connections you have, the more vulnerable you are," says Patricia Fisher, president of security consulting firm Janus Associates in Stamford, Conn. "That's regardless of operating system."

Don't count on available open systems security features to protect you: IS and business leaders polled by X/Open Co. found them woefully lacking (see chart at right).

In a 1992 survey prepared for the American Society for Industrial Security (ASIS), nearly half of the 246 companies responding said they had been victims of attempts to misappropriate information.

Of those, 58% of the tries were made by disgruntled current or former employees. Another 12% were made by vendors, suppliers and subcontractors. Major companies are understandably hesitant to speak about security breaches or precautions.

Yet the problem is escalating.

According to Richard Heffernan, president of R. J. Heffernan Associates in Branford, Conn., which conducted the ASIS survey, the number of attempts per month rose 260% between 1985 and 1992.

Today, losses are roughly estimated at $20 million to $100 million a year.

Physical security is hugely important, security analysts stress. Fisher says the issue comes down to how well you administer, monitor and check your system. "You can have the best access controls in the world, but if you don't use them properly, it's no good."

SECURITY

"Rate the adequacy of security features of facilities in open systems"
(Areas ranked "Inadequate")

1.	Standard formats for networked multivendor systems
2.	Distributed networked systems
3.	Standard formats for homogeneous systems
4.	Customizable interfaces
5.	Nonrepudiation

SURVEY BASE: 146 U.S. EXECUTIVES

Source: X/Open Co., Reading, England

Get control

Yet it is precisely this physical control of open, distributed systems that so many organizations ignore.

Don't believe it? Then take this simple test: Do your LAN administrators handle all LAN activities — including assigning passwords, IDs and levels of security — without someone else auditing their work?

And what about your programmers? Do they have access to your computer operations — letting them, say, make changes to your payroll system? If you answer "yes" to either question, you've neglected one of the fundamental building blocks of security.

"The first rule of adequate controls is good separation of duties," says Bob Janusaitis, a technical manager at BSG Consulting, Inc. in Houston.

"In the mainframe world, jobs get carved into pieces where someone can do specific security functions eight hours a day," he says.

Open insecurities, *page 122*

OPEN INSECURITIES

CONTINUED FROM PAGE 121

"But in the distributed environment, the system administrator has nearly complete control across the network operating system to set up users, do backups and access data."

According to experts, computer crimes are traditionally uncovered by accident or by audit. But one problem is that too few companies have audit trails that let someone see what a LAN administrator — or anyone else — has been up to.

Think it doesn't happen? Ask David Grubb, a computer security officer at Lawrence Livermore National Laboratory in Livermore, Calif.

His lab is connected to the Internet — making Lawrence Livermore's network about as widely distributed as a system can get. A few months ago, the lab's computer security group discovered that someone had turned the lab's network into a party line.

"A very talented hacker found ways to break into Sun's Unix workstations and change the state of their Ethernet controllers to 'promiscuous mode,'" Grubb says. "That let him listen to traffic and grab user names and passwords as they went across the network."

The result was an ever-expanding web of access that Grubb and his colleagues had to shut down, computer by computer.

Fire walls hot

How do you avoid similar situations in your organization? First, Grubb recommends that you never attach your most sensitive machines to the network that hooks to the Internet.

Second, build fire walls around your system to help prevent unauthorized access. And one more thing: Hire the finest professionals you can to build those fire walls.

"A fire wall's effectiveness depends entirely on the skill of the person raising that barrier," Grubb says.

Because of the work it does, Lawrence Livermore is under constant attack by some of the finest hackers roaming the Internet. Chances are, you'll face less talented foes. Equally likely, it won't matter — thanks to all that remote access software your users have installed around the company.

Hacker practice

Walk around the office at night. There's a good likelihood you'll find at least one PC left on and logged into the network, so employees can conduct their work while on the road. The trouble is, if they can log on, so can everyone else.

Try it yourself. Sit down at your computer some night and, starting with your company's main phone number, randomly dial to see where you get in. Once you find your portal, guess at that person's password — using common words like Viper or Dodgers or Fall. It can be distressingly easy.

"We try to discourage PCAnywhere and programs like it," says John Bridgeford, systems consultant at Computer Solutions and Services in Delmar, N.Y. "To my knowledge, there are no effective controls to prevent it from being exploited."

If that doesn't make you cringe, perhaps this will: Your staff installed network access codes on all those lovely laptops taken on the road. And economic espionage is definitely on the rise.

"Misappropriation of data is something that is very much a part of the competitive nature of business today," says Heffernan Associates' Heffernan, who helped the Federal Bureau of Investigation produce the film, *Economic and Industrial Espionage: Piracy in the 20th Century.*

"We are getting instances where we find that the data on missing machines has been looked at," says Ed Zeitler, vice president of information security at Fidelity Investment Co. in Boston. "The reality is, the information on those drives is much more valuable than the equipment itself."

To counter such losses, Fidelity either encrypts the drives or installs access control software on all laptops that venture outside its offices. □

Garner is a free-lance writer based in San Carlos, Calif.

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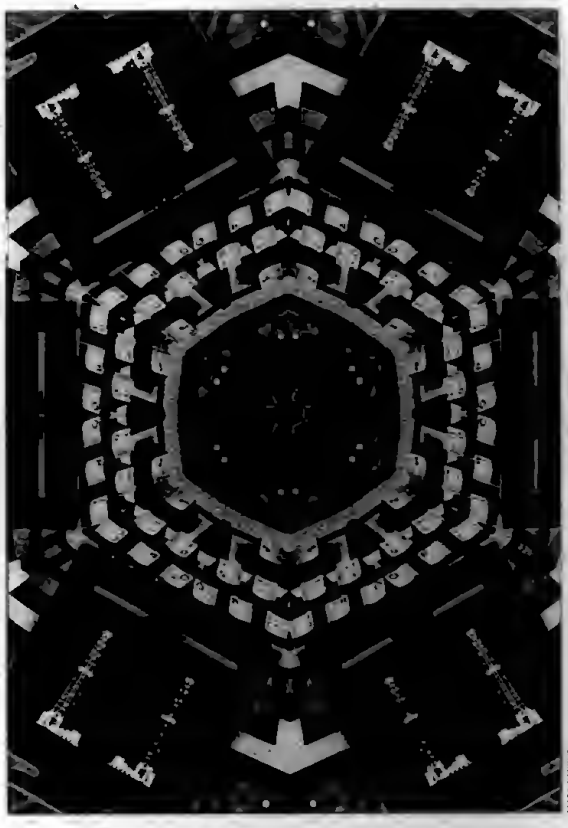
VERTICAL POWER

By Kathy Melymuka



MARC YANKUS

FOR DECADES, VENDORS peddled computer standards to users. Now, after years of heel-dragging, the shoe may he shifting to the other foot.

Analysts say that collaborating competitors — notably The Petrotechnical Open Software Corp. (POSC), the oldest and perhaps strongest such group — are beginning to give IS a bigger role in setting directions for open systems.

New groups in medicine, manufacturing and other vertical industries are emulating the oil industry in hopes of steering open systems evolution.

"To some degree, it's a shift of power to the users," says Paul Cubbage, a longtime open systems analyst and director of Dataquest, Inc.'s client/server program. "[Industry groups] are telling vendors what veodors will supply."

"What makes POSC unique [among standards efforts] is that it's fundamentally driven by nsers," adds Sebastian Holst, director of the Petroleum Business Unit at UniSQL, an Austin, Texas, database vendor. "At ANSI and the others, it's all vendors and technicians."

Best of breed

Instead of creating new specifications, these user-driven boards pick and choose among existing "best-of-breed" standards for data storage, network, user interfaces and hundreds of other areas of open systems-based computing.

Although motivators and approaches differ from industry to industry, cost-cutting and data sharing are common goals.

In health care, nearly a dozen different open standards organizations are at work, spanning such diverse areas as insurance, prescription drugs and electronic imaging.

Industry leaders hope to unite these independent efforts and work closely with hardware and software vendors to develop new opeo products.

"Everything is in place but the money," says Donna Ganzer, vice president of health care informatics at the American Hospital Association in Chicago.

The Computer Based Patient Records Institute (CPRI) in Chicago is seeking a grant from the National Institute of Standards and Technology (NIST). NIST has earmarked $185 million for development of a health-care information infrastructure.

CPRI has already created the Healthcare Open Systems and Trials Program to support prototyping, test standards and run large-scale integratioo trials if and when funding arrives.

In manufacturing, interoperability is driven by the U.S. Department of Defense's well-funded push for "agile" manufacturing. It says the aim is to link defense firms and commercial manufacturers into flexible, virtual corporations.

Open prerequisite

To create the commoo infrastructure required by such agility, developers are looking at open standards and middleware.

A big challenge now is identifying useful standards, says Chris Hamilton, a product marketing manager at Microelectronics and Computer Technology Corp. in Austin, Texas.

Some critics doubt that dozens of federally funded cooks will come up with a palatable offering, however.

Infant efforts would do well to emulate POSC. Formed in 1989 by five major oil companies, the member-funded group now boasts 80 members, including seveo of the Top 10 oil producers and most industry software vendors.

A main thrust is finding better ways for members to share nonstrategic information. "Lots of money and time and energy is wasted chasing data," explains Gary Vasey, director of Cap Gemini America, Inc.'s oil and gas practice in Houston.

POSC aims to link islands of information so companies can focus on company and industry competitiveness, according to POSC Chairperson Yvonoe Donohoe.

The goal, explains Donohoe, a global information technology consultant at British Petroleum, is "bringing [information] out of . . . a single company to an eotire industry."

In the process, POSC hopes to cut data storage costs 90%. To that end, it's developing standard data models.

Powerful new open systems groups in manufacturing, petroleum, health care and others are gaining big name members and clout. Will they fizzle or flame?

Drumming up support

POSC is also working to ensure industrywide application interoperability. And it's trying to persuade vendors to create software for the standards it supports.

But, Vasey says, "Vendors are dragging their feet wondering how they'll find the money."

Nonethless, POSC seems to be gaining momeotum: It sponsored 30 user/vendor pilot projects this year, providing everything from testing to "do-it-yourself" handbooks, code and data models.

So far, only a handful of POSC-compliant application software products have come to market. But leaders say more demos and prototypes will appear in 1995 as standards gel. □

Melymuka is a free-lance writer in Duxbury, Mass.

HOT HANDS, COLD

COMPANY	ANALYST	MAJOR STRENGTHS	MAJOR WEAKNESSES	ABILITY TO DELIVER PRODUCT
APPLE COMPUTER, INC.	**Tim Bajarin** *President, Creative Strategies Research International, Inc., San Jose, Calif.*	Finally has accepted reality of heterogeneous environment. Supports Intel, Unix, Windows while retaining Mac's uniqueness.	Architecture still limited to file exchange. Windows and DOS software emulation OK (via SoftPC) but too pokey for most PC users. Mixed networks of PCs and Macs can be quirky.	Serious time and dollars invested in open strategy. Failure to garner wide industry and developer support for OpenDoc could prove fatal.
COMPUTER ASSOCIATES INTERNATIONAL, INC.	**Rich Finkelstein** *President, Performance Computing, Inc., Chicago*	Newly acquired Ingres RDBMS gives high-quality access tools for major DBMSs. CA-Unicenter provides Unix-based network management tools for daily work in heterogeneous environment.	Too many old chestnuts in product line. Ho-hum buyer response to Ingres, whose engineering and sales staffs have fled in droves. Weak PC market presence. Poor desktop compatibility with Intel, Windows, NT, UnixWare and NetWare.	Good if heavy investments are made in Ingres. Bad if CA follows pattern of milking products without more funding for R&D or integration. More cross-platform acquisitions in next few years?
DIGITAL EQUIPMENT CORP.	**Wesley Melling** *Program director, system software technologies, Gartner Group, Inc., Stamford, Conn.*	Boy Scout enthusiasm in funding, leading and supporting open standards groups. Products feature good open interfaces, strong interoperability. Boasts only 64-bit Unix operating system on market.	Abysmal overall buyer confidence. Inability to market OSF/1. Motley sales crew keeps Digital off many short lists.	Strong. Can deliver applications portability, systems interoperability and Unix products.
HEWLETT-PACKARD CO.	**Robert Herwick** *President, Herwick Capital Management, San Francisco*	Highly scalable systems family. Strong RISC-based Performance Architecture and HP/UX operating system. Great third-party applications support. Attractive cost of ownership.	Playing price/performance catch-up in symmetrical multiprocessing. Only zit: Competitors offer more cost-effective transaction processing.	Strong, thanks to wide industry support. New focus on systems integration and open systems support should add even more oomph.
IBM	**Peter Burris** *Director, worldwide systems and service research, International Data Corp., Framingham, Mass.*	Networking blueprint and AS/400 and RS/6000 communications software. SNA gives strong interoperability; will flow over TCP/IP. An aggressive follower of standards.	Open application development. Being all things to all people has hurt.	Unmatched knowledge of installed base. Success depends on new features and user willingness to buy broad view of interoperability.
LOTUS DEVELOPMENT CORP.	**Matthew Cain** *Program director, workgroup computing strategies, Meta Group, Inc., Westport, Conn.*	Portability of Notes and CC:Mail to OS/2, NetWare and SunOS.	Lots left to deliver on both front and back end. Some problems reported running Notes over TCP/IP.	Who knows? Lotus Communications Server delayed until 1996. CC:Mail needs rearchitecting to include X.500-type directory service, seamless Notes links.
MICROSOFT CORP.	**David Card** *Director, systems research, International Data Corp., Mountain View, Calif.*	Awesome product interoperability. Ability to set de facto desktop standards for industry. Widely published interfaces invite third-party input. OLE solid for low end. Visual Basic.	Poor hooks into NetWare and other competitive products. Narrow view of openness; largely ignores Macintosh, Unix, OS/2 desktops. Won't port SQL Server to other architectures.	Depends on outside application developers. Hinges on ability to deliver published APIs and third-party development tools.
NOVELL, INC.	**David Cearly** *Services director, workgroup computing strategies, Meta Group, Inc., Westport, Conn.*	NetWare is heterogeneous connectivity, despite proprietary pieces. Sells 70% of network operating systems. Large, smart VAR community. Good user cooperation.	Inability to execute vision. Poor technical and strategic integration of acquired technologies. NetWare 4.0 unstable, lacks adequate features for upgrading 3.0 users.	Organization in turmoil but should be able to integrate various lines. Published APIs popular with wide range of vendors.
ORACLE CORP.	**Herb Edelstein** *Principal, Euclid Associates, Potomac, Md.*	Warm embrace of SQL and XA standard for two-way communications in heterogeneous environments. Runs on more hardware and operating platforms than any other DBMS.	Foreign data sources need not apply. Version 6 was read-only to outsiders. Version 7 offers new gateways but requires local Oracle database at each site. Only credible links are to IBM databases.	Proprietary heart of Oracle DBMS makes transport tough. Needs to stop letting third parties provide all outside links.
SUN MICROSYSTEMS, INC.	**Jim Brennan** *Senior director, WorkGroup Technologies, Inc., Hampton, N.H.*	Standards booster. Dedicated business unit offers software, hardware, support, integration. Willing to license technology to other vendors. WABI lets Unix users run Windows apps.	Slipping hardware performance. Joint development pact with Fujitsu may or may not improve floating-point technology.	Excellent. Not an ounce of proprietary baggage. Send more horsepower!
SYBASE, INC.	**David McGoveran** *President, Alternative Technologies, Boulder Creek, Calif.*	Database connectivity in heterogeneous environment. OpenClient and OpenServer let users build SQL Server look-alikes. Strong suite of gateways, including OmniSQL.	Connectivity products lag behind Sybase 10 database engine. Result: Performance gaps.	Mind-boggling breadth of architecture and functionality. New standard API called TDS will improve links to other databases, systems managers and infobahn protocols.

FEET

Vendor commitment to openness ranges from wanna-be to 'yes, indeed'

KEY: 1) Strong vision and implementation **2)** Shows promise but lacks momentum **3)** Good products, sketchy vision **4)** Interesting vision, shy on open products

—Data compiled by Leslie Goff, a free-lance writer in New York, and condensed by Joe Maglitta, Computerworld senior editor, Corporate Strategies.

VISION	HOW BUYERS SEE VENDOR	MOMENTUM	NEXT BIG MOVE	COMMENTS	GRADE
Much better than two years ago. Surprisingly cohesive, considering stubborn insistence on Mac propriety.	Moving in right direction. Macs widely seen as more network-friendly than PCs. Corporate buyers remain wary.	None for big buyers. Gaining in small business and home office. Need answers about compatibility with OpenDoc and OLE 2.x.	System 7 Release 5, featuring more PC-friendly features. Also, next A/UX version by year's end.	"A proprietary architecture . . . has various obstacles to working in a truly open environment. OpenDoc is important. But until it's fully implemented and accepted, it's still a weakness."	2
Poor and unarticulated. Ingres and Unicenter handled by separate divisions.	Stern toll-taker uninterested in developing new technology. Custodian of captive and otherwise moribund applications.	Continues to increase, thanks to continued harvesting of money-making pickups from troubled companies.	Unclear. Best bets: IDMS and Datacom support for Ingres that would give users cross-platform GUI tools.	"Two or three years ago, CA outlined a plan to develop object-oriented SQL interfaces for data communications and its IDMS database. I've seen nothing to date that leads me to believe it can fashion a cohesive story in the near future."	3
Good. Includes interoperability with legacy systems as well as Unix and Windows NT.	Still stuck on VMS. Flaccid Unix support.	Catch-up mode but gathering steam. Hordes of VMS bigots slow to embrace Unix. Company says Unix sales skyrocketed 80% in latest quarter.	Very high-end Alpha 7300 systems featuring faster chips and I/O plus better price/performance. Fall debut should include incremental boosts to existing software.	"DEC has never considered Unix equal to open, which it isn't. But for the last five years, it has been politically correct to say so, so DEC has appeared, at times, to be opposed to the open systems movement."	2
Customer-driven and strong. No longer hung up on being one-stop supervendor.	Big ears and sensible talk. Best option for open midrange systems, thanks to robust performance and big software suite.	Awesome. On everyone's short list, but HP's not complacent. Despite growing enterprise competition, biggest booster of IBM and Digital.	Probably next month. Watch for major boost in hardware price/performance.	"When HP launched Performance Architecture, it was No. 3 behind IBM and DEC, so it . . . learned to embrace open systems. Now it has taken a leadership role in supporting third-party options."	1
Overall strategy makes sense, but real products must follow. Flexibility needed to stay with market.	Improving vis-a-vis open systems.	Slipping but still strong. Some 40% of corporate accounts would still call IBM primary supplier.	Flood of open hardware, software, connectivity and service announcements this month.	"IBM still has to work out an internal tension between servicing its large installed base in an expeditious manner and promoting new, higher revenue-generating technologies."	2
Necessity is the mother of openness. No operating system, so multiple platforms cool idea.	Strong alternative to Microsoft's all-Windows fanaticism. Some concern about future links with Apple, WordPerfect.	Very strong for Notes and CC:Mail, limp for applications.	Notes 4.0, Q3 1995. Expected: simpler interface, OLE 2.0 support, single-server sign-on. Notes support of SCO, AIX, HP/UX by year's end.	"While Notes traditionally has been a somewhat closed database architecture, Lotus has gone a long way . . . so you can use multiple third-party development tools to create Notes applications."	1.5
Self-centric. Windows everywhere.	Trendsetter, pole star, "IBM of the '90s" for better or worse.	Tremendous on desktop and workgroup. Efforts to woo IS and back-office applications need seasoning.	Daytona at fall Windows World. Look for TCP/IP, Novell connectivity. Early 1995 delivery of Chicago with built-in networking.	"Microsoft has a strategy that lays out core technology for workgroups that is very visionary and well laid out, but all the core products have to come from Microsoft."	4
Clear. How they'll do it is far from clear.	A safe bet that also keeps Microsoft from running amok.	Probably peaked. Windows NT will erode about 15% of base.	NetWare 4.1 in next four to six months. Look for improved directory services and migration tools.	"1995 will be a watershed year for Novell. It has . . . to deliver on its vision of being a company that provides heterogeneous connectivity and advanced networking services. . . . It cannot be complacent."	2.5
Dazed by ping-ponging between slow pace of standards, rapidity of DBMS development.	Strong but isolated.	Growing. Last quarter's revenue up more than 40%.	Symmetric replication by year's end. Release 8 should address objects.	"Reports have surfaced about ongoing negotiations to acquire Gupta Technologies, which has a nice connectivity story to tell and marketplace acceptance for its third-party database tools."	2.5
Very consistent, from top to workers in customers.	Unix powerhouse morphing into client/server monster. Strong reputation and big buyer base push Sun onto short list.	Pretty strong in workstations but vulnerable to Unix midrange boxes. Needs boost from 2-year-old push on commercial Unix servers.	Within next year: UltraSPARC, 64-bit architecture. Also, better SPARC price/performance; Solaris port to Intel, PowerPC platforms.	"Sun has never positioned itself as the industry leader in hardware performance but as providing solutions to business problems. It tries to sell on the basis of value."	1
Very cohesive, underpinned by strong gateway and connectivity products.	Very strong interoperability. Sales force is spottily articulate. Some frustration with functional gaps and lack of two-way SQL compatibility.	Surging in connectivity, wilting in database servers. Revenue up 67% latest quarter. Merger with Micro Decisionware, Inc. broadened market.	Sybase 11, early or mid-1995. Includes retooled database engine, more concept. Also expect new LAN and mainframe gateways.	"I don't think anyone has their arms around the scope of Sybase's future. The company has more opportunities than it can even pursue at one time."	1

SPEC 1170

This new standard — boasting more than1,000 specs — is supposed to be the future of Unix. But the past is already back to haunt . . .

By John Webster

UNIX HAS LONG BEEN the Hydra of corporate computing, a multiheaded monster with legendary incompatibilities across versions sold by a horde of vendors. The new Spec 1170 specifications that were announced last September by X/Open Co. are supposed to put one face and one heart on the much-mutated operating system.

Don't count on it, industry analysts and information systems managers say.

Buyers won't see products complying with the new guidelines for at least six months, but questions and concerns are already surfacing in the Unix community.

Analysts warn that Spec 1170 won't cover every software hook and hardware platform quirk in Unix. Many believe that means vendors will have enough leeway to create a new generation of incompatible Unix products.

The reason: Only about 60% of what composes Unix is covered in the new guidelines. That includes current Unix application systems calls such as OpenFile, Print, X Window System terminal calls and NM strings.

"Spec 1170 is touted as the golden bullet, but it's nothing more than an incremental approach" to unifying Unix, cautions Richard Buchanan, a senior analyst at Forrester Research, Inc., a market research and consulting firm in Cambridge, Mass.

Another 20% to 30% of Unix's composition is dictated by other industry initiatives, notably the Common Open Software Environment's (COSE) Common Desktop Environment.

The remaining 10% to 20% of what is now called Unix — including such key operating environment pieces as networking, systems management, security and processor compliance — can still be customized by vendors.

"I expect there will always be differences in Unix," says Denis Brown, chairman of the X/Open User Council and vice president at systems integrator PRC, Inc. "Whatever vendors add to the Spec 1170 core will present a differentiation. It's conceivable that somebody will continue to build their own version, called 'Spinex' or whatever."

Scott Winkler, a research director at Gartner Group, Inc. in Stamford, Conn., points out that Spec 1170's original intent was to make Unix look more viable compared with Microsoft Corp.'s Windows NT. "It gives Unix a better image, but it doesn't level the Unix playing field."

WHAT IS SPEC 1170?

- X/Open says Spec 1170 will let organizations mix and match Unix operating systems and platforms without incompatibilities.
- It includes roughly 1,170 application programming interfaces, including systems and library calls, available to Unix systems vendors and software developers.

Not a cure-all

X/Open developers acknowledge that the 1,170 specifications are not a panacea. Nor will they guarantee that organizations can mix and match Unix operating systems and platforms without incompatibilities.

"We can't do an ideal job," says Roy McKean, business manager for technical membership at X/Open. He says Spec 1170 creators tried to raise the base compatibility of Unix another level.

But, he adds, "You have to remember that we're talking about a specification that is covered in 2,000-plus pages. We tried to choose things that would cause the least possible conflict among Unix suppliers."

Hewlett-Packard Co., IBM, Novell, Inc. and other vendors concede that differences will remain among their Unix products.

"Spec 1170 leaves a lot of opportunity for differentiating Unix," says Jeff McNair, open systems program manager at HP in Fort Collins, Colo. "There's no doubt there will still be competing implementations."

Even so, McNair and others assert that such enhancements won't affect core compatibility among vendors. And to ensure compatibility between old and new Unix, vendors say they will ship either updates or entirely new products.

Many IS managers say they don't yet know enough about the standard. But Michael D. McClendon, MIS director at Drummond, Inc. in Birmingham, Ala., is among the legions loath to get trapped by a system "open" in name only.

Implementing Unix, McClendon says, is "almost like buying a mainframe system. Once you commit to a vendor, you're stuck with them. We don't want to be bound to a particular vendor's hardware."

Mark Sanders, director of information services for the city of Glendale, Calif., says he believes "vendors will continue to attempt to protect their individuality."

"I think there will always be efforts by vendors to distinguish their products with different software books," agrees Jerry L. Johnson, standards analyst for the state of Texas' Department of Information Resources in Austin.

Still, he remains optimistic. "I hope COSE and Spec 1170 allow vendors to distinguish their products by other means. The industry can't afford another Unix feud." □

Webster is a free-lance writer in San Francisco.

COMMENTARY

By Charles Babcock

Warring weavers

ANDY FREBERG

A safety net of standards is slowly being woven beneath the trapeze act of companies trying to build business systems using object technology.

But deep tensions remain between weavers and high-flying IS leaders trying to make it from one platform to another without falling through the holes.

In one corner of the net, Microsoft is making rapid progress with OLE for Windows applications. OLE has enjoyed wide acceptance.

In another corner, Apple, IBM and many Unix vendors see object-based software as their next competitive front with Microsoft. They have joined hands to form the Object Management Group (OMG).

As long as all parties cooperate, IS managers will be protected — no matter how high above the ground. But the commitment among the sometime rivals to work together remains shaky.

Without standards, the mix of systems on most networks will preclude chances of activating objects across different hardware platforms.

Microsoft, an OMG member, so far hasn't backed the group's CORBA standard. Instead, it commissioned Digital to generate specifications for Microsoft's Common Object Model.

But OLE and OpenDoc — another compound desktop architecture created by IBM, Apple and Novell — in many cases activate objects in different ways. Such conflicting schemes will force IS to track the origins of nested objects and activate them accordingly — a huge pain.

How will both approaches work together? "Good question," says Microsoft's OLE senior product manager Dave Seres.

For now, work completing the safety net proceeds slowly. The authors of OLE and OpenDoc remain caught in the web of their own contentious relationships.

If they fail to persist, the warring weavers could unbalance IS enough to halt the show altogether. □

Babcock is *Computerworld*'s technical editor.

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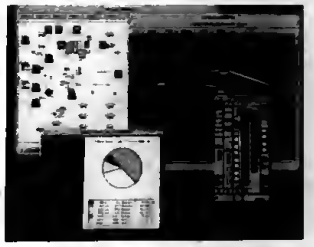

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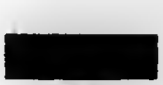

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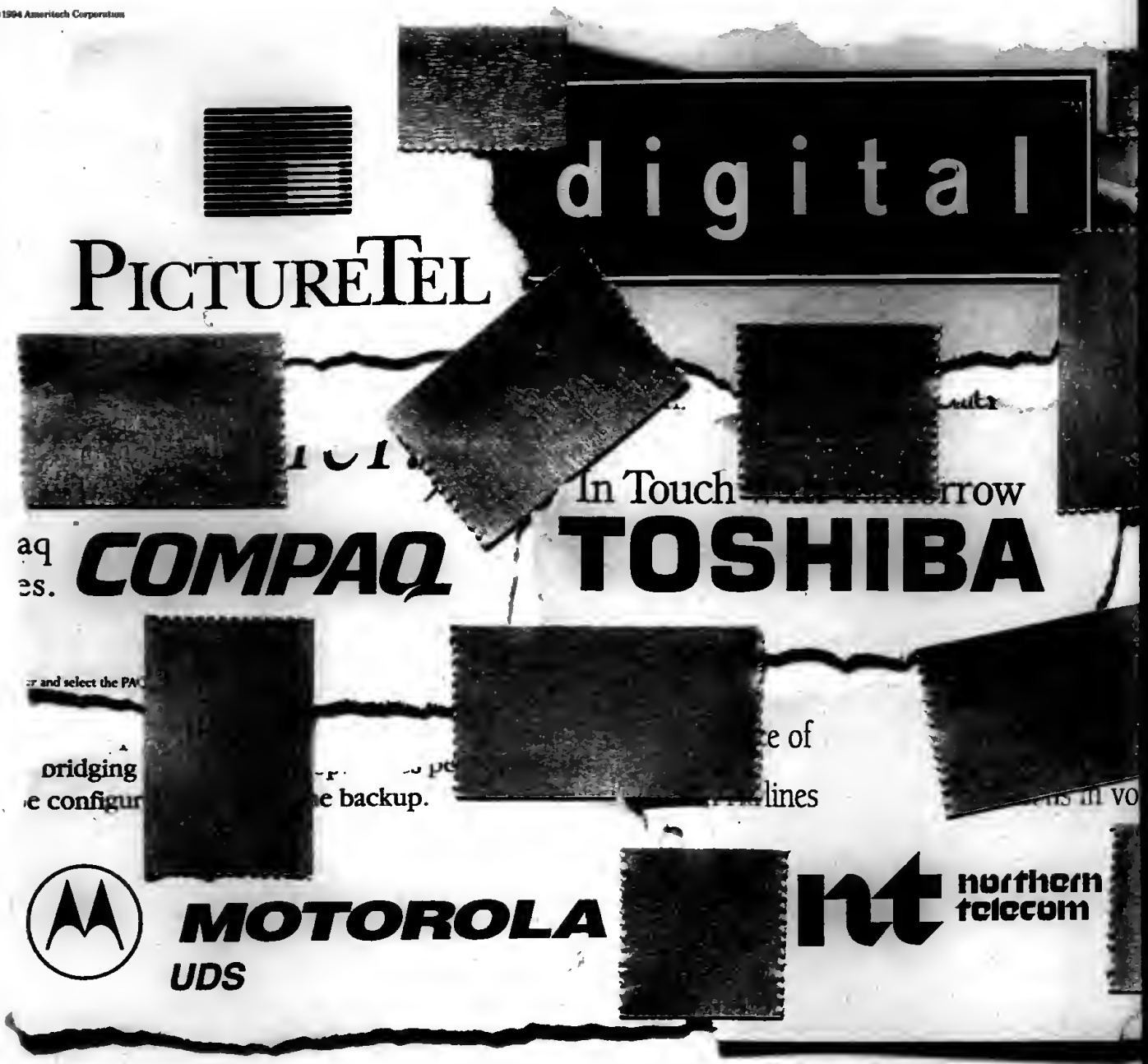

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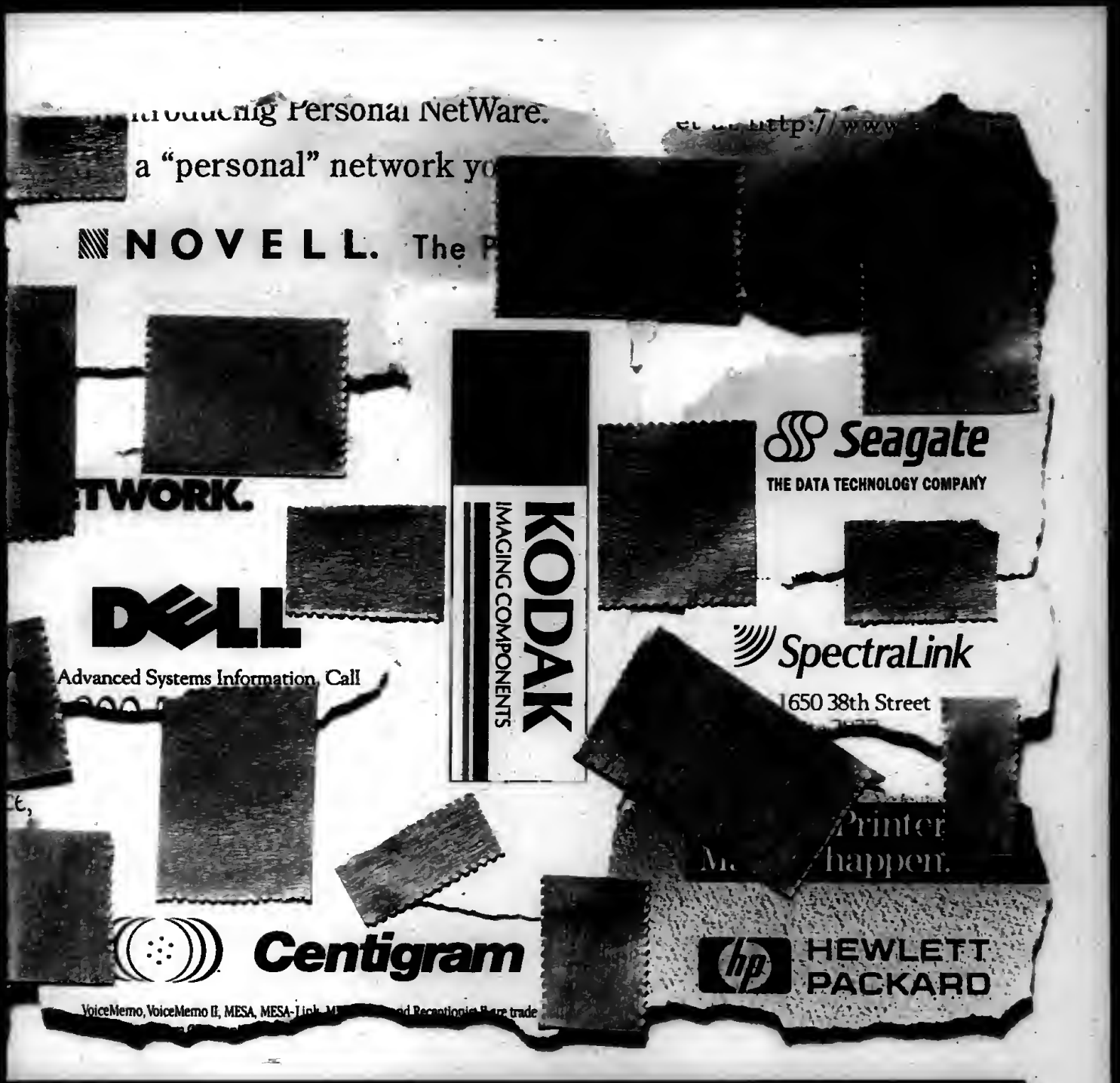

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UNIX RIPS . . . NT TRIPS

By Michael L. Sullivan-Trainor

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under review is being used in live application environments.

- **Unix, primarily HP/UX, is firmly established as the corporate server of choice in these companies because of key applications designed for Unix platforms.**
- **Windows NT fails to meet the enterprise stress test for some large organizations because of its immaturity and Microsoft's perceived lack of understanding of large corporate users' needs.**

FIRING LINE
CORPORATE STRATEGY

MICROSOFT CORP.'S WINDOWS NT has a long way to go to pose a serious challenge to Unix enterprise servers. It must overcome basic weaknesses in reliability, support and standards compliance — key factors that define the corporate computing environment.

This view is the consensus of four large, representative organizations that use both Unix and Windows NT in enterprise applications. They include multinational manufacturing, financial, health care and telecommunications organizations.

WHICH TO USE

User sites interviewed run mostly Hewlett-Packard Co.'s HP/UX. Sun Microsystems, Inc. and IBM Unix were tied for second. Unix systems resided on servers in manufacturing, administrative and field offices. NT use is limited to less critical corporate applications, though one user was replacing Novell servers with NT Advanced Server.

Manufacturer 1: "I don't think it's a question of Unix vs. NT. It is a question of appropriate technology. There are some places where Unix will be prevalent for quite some time. There will be places where it's desirable to deploy NT-based solutions. The question then becomes, 'How do we get these things to work together?' "

Finance: "For us, the greatest story for NT is that it forced the Unix vendors to really talk to each other. Just for this we are thankful for NT. NT is also going in the right direction — it's going to be a very good operating system. It still has about a year or so to mature and really make it.

"NT is for a different level of application than the Unix servers. It will not replace Unix servers. We do see it competing with Novell. Novell's UnixWare ideally was a competitor, but today it is limited to desktop Unix. When UnixWare and NetWare merge at some point, there might be a good alternative there."

STRATEGY

Users interviewed are most concerned about long-term interoperability and ease of migration. While Unix vendors have had smooth shifts — with the exception of Sun's Solaris — NT's future is in doubt. Reason: conflicting future systems such as Daytona and Cairo.

Manufacturer 1: "Our long-term strategy is based on the Open Software Foundation's Distributed Computing Environment [DCE]. We're very interested in providing solutions that make NT and DCE and the systems within DCE talk to each other. We would very much like to see NT and NT Advanced Server domains become total good citizens in the DCE environment."

Finance: "With the changes to Cairo, we're wondering how much of a migration will it be? Are we going to go to a Daytona-like version of NT, and then when Cairo comes we'll have a very painful migration? We wonder should we really commit at this point. But we also approve of the object orientation of Cairo."

PRODUCTS

Reliability is job one for these enterprise systems. But some users are wary of NT's newness; they say performance bugs must be worked out. Unix, on the other hand, has been tried and tested. That explains users' high confidence in Unix vendors, especially HP.

Finance: "Microsoft is still struggling on the way up the enterprise. In coming from the desktop and trying to go forward, they still lack an understanding of enterprise requirements such as reliability and support, though we witness their efforts."

Manufacturer 2: "Microsoft needs to establish a track record . . . showing they have some staying power with our other strategic suppliers."

Health care: "NT Version 3.5, which is the latest release, is more solid and takes up less resources. We're impressed with it, and we're using it to replace our NetWare servers. NT's biggest strength compared to Unix is a common interface. Unix has no common front end. Each vendor has designed their own management shell, and they only do half the job. You still need to go into native Unix."

Users want it all when it comes to service

TECHNICAL SUPPORT

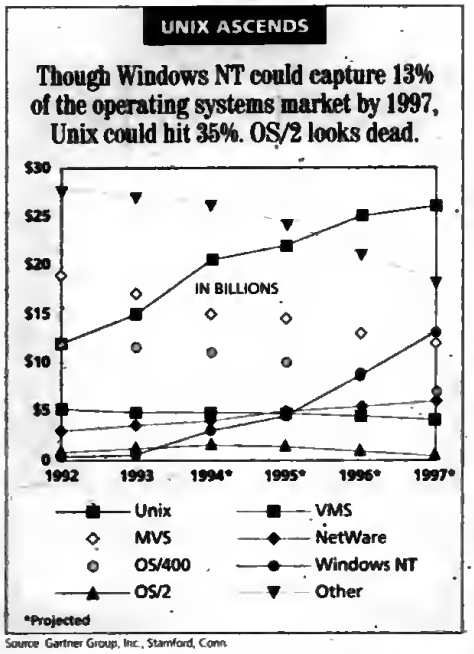
Users want it all when it comes to service. It must be readily available, in-person, high-quality, worldwide technical support. The Unix

Open Systems Face-Off

Ratings are based on a 1-to-5 scale where 5 represents meeting the user's enterprise needs and 1 represents not meeting the user's enterprise needs

OVERALL RATINGS

MICROSOFT (Windows NT)	CATEGORY	UNIX VENDORS (Primarily HP)
3.6	STRATEGY	4
3.3	PRODUCTS	4.3
2.3	SUPPORT	4
3.3	STANDARDS/ OPEN SYSTEMS	4.3
4	FINANCES/POLICIES	3
2.6	COST	2.6



Source: Gartner Group, Inc., Stamford, Conn.

vendors do it, they say; Microsoft largely doesn't.

Manufacturer 1: "The primary place it's a problem is outside the U.S. We got to the point where our international organizations were asking us to consider alternative software for the operating system. Instead of Windows, they wanted to use OS/2 because of the availability of IBM service worldwide."

Finance: "We were spoiled by the mainframe vendors. When the mainframe goes down, they filled a truck with engineers and came and fixed it. In the Unix environment, HP and IBM come and help us when we are in a catastrophe. Try and do the same thing with Microsoft and good luck. We cannot afford the system to be down."

Health care: "People don't want to pay for NT support because they look at it as a PC product. We have a support contract that cost tens of thousands of dollars. You get what you pay for."

STANDARDS AND OPENNESS

Conformance to industry standards is the key to interoperability, according to users. They will tolerate Microsoft's partial compliance and push to make its own approach "standard." But they will not commit fully to NT on an enterprise level without some assurance of full standards support.

Finance: "It's very simple: Microsoft does not believe in standards. They will not admit they will directly support DCE, but they will be compatible with it. They have an ability to maneuver around standards and use the ones that are important. We would like to see them become more involved, although we understand their desire never to depend on technology."

Manufacturer 1: "In areas of well-defined Unix turf, the Unix vendors rate highly. In the areas of developing standards, like DCE and CORBA, some of the vendors are not moving fast enough."

Health care: "Monopolies aren't all bad. When you open the box from Microsoft you get compatibility with TCP/IP, AppleTalk, NetBIOS, etc. When you open the Unix box, sure it supports TCP and Unix-specific connections, but not much else."

FINANCES AND POLICIES

Good financial health is a plus for Microsoft. Internal policies revealed in July by the federal government have left some doubts in the users' minds.

Manufacturer 1: "The recent U.S. Department of Justice case shows some interior problems with Microsoft in being anticompetitive. In terms of Microsoft's ability to deliver excellent products, the agreement might be wonderful. In terms of being able to keep the market open and allow competition, it might not be a good thing."

COST OF OWNERSHIP

Both Unix and NT turned out to be more expensive than the users bargained for, but for different reasons. Unix leaves administrative issues and interoperability questions unaddressed. NT requires more support, with less help available from the vendor.

Finance: "Microsoft is significantly more expensive than we expected. They keep the direct price lower, but the indirect price of support you have to provide yourself is higher.

"We never bought the idea that if you buy Unix, you'll save a lot. If you add the issues of training, support, lack of systems management and interoperability, the gap is shrinking — maybe 20% less than the mainframe."

Manufacturer 2: "Although the initial purchase price for NT is quite attractive, upgrade costs in the PC area are 100% of the original purchase price. The administrative burden for managing the NT servers is higher than we anticipated."

Health care: "We had to use more hardware resources for NT than we expected, but the management was less because of the Windows GUI. With Unix, the biggest problem has been inconsistent interfaces." □

Sullivan-Trainor is *Computerworld*'s senior editor, CW Guide.

DESKTOP OPERATING SYSTEMS

"Which are you currently using?"

Unix/Variant	83%
Unix CDE	15%
Windows NT	23%
Windows NT Advanced Server	14%

"Which do you expect to begin using by the end of 1997?"

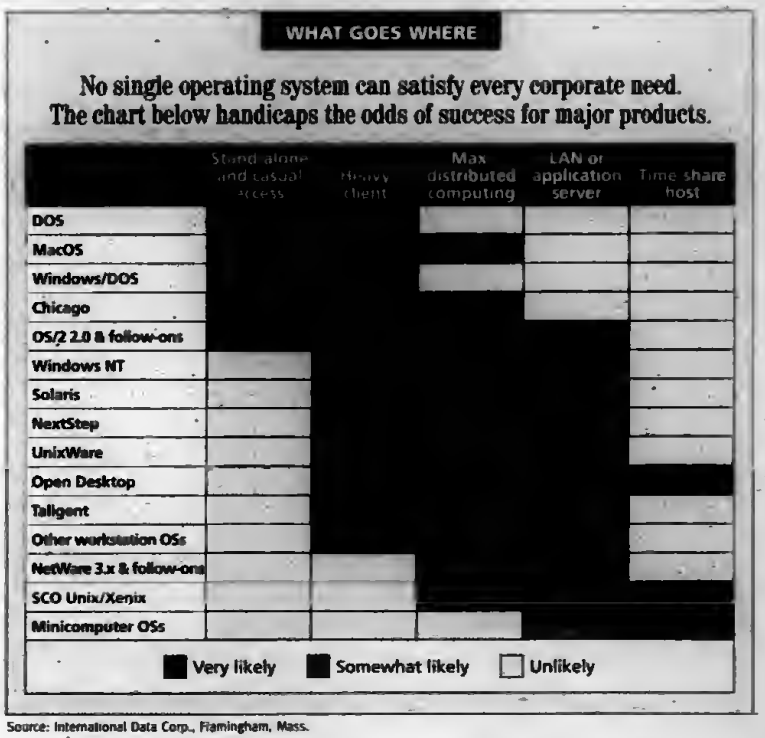
Unix/Variant	9%
Unix CDE	34%
Windows NT	35%
Windows NT Advanced Server	29%

SURVEY BASE: 146 U.S. EXECUTIVES
MULTIPLE RESPONSES ALLOWED

Source: X/Open Co., Reading, England

Good financial health is a plus for Microsoft

NT requires more support, with less help available from the vendor



Source: International Data Corp., Framingham, Mass.

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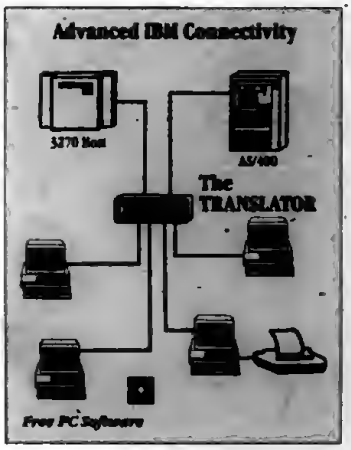

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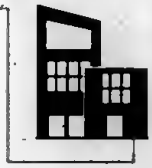

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What's the biggest challenge for open systems in the year ahead

Compiled by Computerworld *assistant researcher Erin Callaway*

"**APPLE** has gone a long way to provide interoperability. That said, there is still a long line of people standing at the door trying to get more. Every time an open systems issue gets cut from the list of users' needs, 10 more get added to the top."

— Bill Monteith, Managing Apple Computers in Information Systems

"**WITH** the shift from vendor-specific user groups to more open systems-oriented groups, we don't have the mechanisms fully in place for acquiring, documenting and sharing details on end-user requirements. So the message to the vendor community can be missing pieces and is occasionally in conflict. We're trying to put together those requirements."

— Ted Hanss, Open Software Foundation End User Forum

"**INFORMATION** technology is not in the glass house anymore, especially when you're using open systems. Users are much more informed about technology now and are often the ones selecting the technology and products that [information technology] is using. So it presents a cultural challenge. We have to be much more customer-oriented and try to use less of our tech talk while we're at it."

— Dorothy Rogers, International Tandem Users Group

"**NASIRE** is trying to urge all 50 states to adopt open systems standards because if they don't, we're going to end up with pockets of information loops rather than one open system nationwide."

— Bradley Dugger, National Association of State Information Resource Executives

"**ONE** of the most difficult issues for some of the larger users is getting the money to make the move from a proprietary platform to open systems. A lot of us just haven't been able to do it because of the cost."

— Tim Boyer, National Association of Data General User Groups

"**THE** real challenge is the speed with which the vendors adhere to our standards. There is still a lot of narrow self-interest involved. Somebody's got to put that aside for the common good."

— Richard Jaross, International Association for Open Systems Professionals

"**WHEN** a vendor says it's committed to open systems, what it's really saying is that it's developing a whole new product based on open standards. In other words, they are creating something new but not making any effort to move the products we are already using to an open platform. Unfortunately, that leaves a lot of users in the same position as when vendors weren't addressing open requirements at all."

— Linda Mainord, Guide International

"**THE** biggest fear is the fear of the unknown. Once you learn that Unix is like every other operating system, it's not so bad."

— Ted Kull, Association of Banyan Users International

"**YOU** really have to know your exact business needs and precisely what you want to accomplish to reap the benefits of open systems. And after a three- to five-year period of companies downsizing and trying to get more for less, that's a bigger chore than you'd expect."

— Charles Piercey, International Association for Hewlett-Packard Computing Professionals

COMMENTARY

By John Danielsen

Speak the same language

There's a major gap in today's open systems standards efforts.

Although major strides have been made by industry groups such as X/Open Co. to bring users and vendors together to work toward common technology specifications, these efforts have focused largely on technology standards.

No one has addressed open systems from the larger process perspective: the communication between users and vendors. This issue greatly impacts the successful application of technology to business problems and, ultimately, productivity and profitability.

Today, we see this gap manifested in the lack of a common information technology language. What one vendor calls a messaging engine, another might term a post office, and so on.

As the industry matures, we increasingly need a standard communication process to help users and vendors arrive at a common, open framework of terms for specific technology segments and business practices.

A standardized vocabulary would encourage consistent communication about products and ensure apples-to-apples comparisons. It would also promote better understanding of how different products might interoperate in a multivendor environment.

Better communication between users and vendors would also improve their understanding of one another's needs. Hopefully, duplicated efforts, costly learning curves and ill-targeted product strategies could then be avoided.

Better communication would guarantee the industry more and better choices — exactly what open systems is about. It's not an easy process, but isn't it time we team up to reap the real rewards of our labor? □

Danielsen is vice president of computing and telecommunications services at Pacific Gas & Electric in San Francisco. He is also chairman of Open User Recommended Solutions, an industry group that focuses on interoperability.

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A Cautionary Tale

By Gary Gack

This is one company's story of an outsourcing effort gone awry. The plan was to save time and money, but instead the developer delivered an application that did too little, too late — and ran $3 million over budget.

Here is the entire sordid story, a true case history, about one company's experience with outsourcing.

The names have been changed to protect the guilty.

About two years ago, a high-volume consumer goods manufacturer, referred to here as company R, decided to develop a new information system to manage its complex distribution operations. The goal was to reduce the labor required for warehousing, packing and shipping and to increase the volume and timeliness of shipments to the retail stores that sell R's products. The system needed to support highly automated warehouse operations such as radio-controlled conveyor systems, automated weighing and bar-code labeling tailored to customers' orders.

A cautionary tale, *page 136*

Continued from page 135

needed to deliver the system fast. Due to the other high-priority commitments of the internal development staff, it elected to outsource the system's design and development to the international firm of Snidely Outsource Unitd. Snidely proposed a distributed, open client/server platform using a relational database and a combination of Cobol, C and fourth-generation language (4GL) development tools. It agreed to deliver a turnkey system in 14 months. The firms signed a fixed-price development contract. The project was a disaster in the making.

Snidely delivered the system three months late at the agreed-upon price (see chart). That wouldn't have been so bad — had the system been able to handle R's work load. It couldn't. Because it failed to activate conveyor gates quickly enough, it misrouted merchandise and forced the company to revert to a manual operation. Worse still, the system lacked controls that could quickly detect and diagnose problems. To keep things running, R spent $2 million for rental facilities, equipment and extra staff.

How could things go so wrong? In its haste to get the distribution system in place, R didn't do its homework. There are some standard, widely used ways to project development costs, defect rates and operational costs. You need to look at them not only as individual items but in relationship to one another. From, say, a development cost standpoint, outsourcing might appear to be a smart choice, but if defect rates or operational costs are out of whack, it's not. Here's how R could have avoided this disaster.

Formula for success

To determine if it was getting a good deal on development costs, R needed to know the cost and duration of similar projects. The standard way to measure such factors is to use function points, which examine inputs, outputs, file inquiries and interfaces to predict the time and effort required to develop a given system.

For this particular project, Snidely delivered approximately 2,600 function points. That translates into 268,000 "Cobol equivalent" source lines — 50% 4GL, 40% Cobol and 10% C. What should it cost, and how long should it take to deliver 2,600 function points? According to Capers Jones' data (*Applied Software Measurement*, McGraw-Hill, 1991), a standard way to measure U.S. averages for IS projects, Snidely would need 325 person-months and could complete the project in 48 calendar months. Snidely's rates were $10,000 per person-month, including overhead and profit; using these numbers, project costs would be about $3.25 million.

Had R used this method to estimate development costs, the project should have cost $1,250 per function point. The contracted cost was actually $1,192 per function based on the actual function points delivered. That's about 5% less than the U.S. average.

From a time standpoint, outsourcing with Snidely looked like a good deal. The system was installed in just 17 months. Even though it was three months late, that's a heck of a lot shorter than the U.S. average of 48 months for this type of project. But when you look at defect rates and measure the negative impact they have on support costs, cracks start to appear in the good deal.

R didn't begin tracking defects until three months after installation. It should have started immediately. During the first eight months of defect tracking, the Category 1 defect discovery rate averaged 211 per month, with a poor rate of improvement. Category 1 defects are those detected at the processor, such as abends and out of balance conditions. R began tracking Category 2 defects, which are user-reported problems that deal with functionality issues, during the seventh month.

The total defect density (defects per 1,000 lines of code, or defects per function point) of Category 1 defects discovered during the eight-month period turned out to be about one per function point, annualized over 12 months. For comparison purposes, you might expect to see roughly one defect per function point for a system of this size in the first 12 months of operation (i.e., the total of Category 1 and 2 defects). This defect rate might seem reasonable compared to Jones' U.S. average.

But when you consider that in a recent 3,000-function point project R's Category 1 rate was fewer than .007 defects per function point (that is, 1/142 of Snidely's first-year rate), this rate isn't reasonable at all. And R's low defect rate in its recent project isn't an anomaly; it's typical of its development projects.

Clearly, Snidely's defect rate doesn't look good. The news got worse for R when, late in the acceptance process, Snidely indicated that R would need two full-time people per installed location (four sites) to support and maintain the system.

Let's take R's average historical support rate of more than 2,000 function points per support person as the basis for comparison. That means R typically requires 1.3 people to support 2,600 function points. But Snidely recommends eight people for the same amount of code. That will cost R $536,000 in excess supports costs — based on 6.7 more programmers at an average cost of $80,000 a year. The deal looked worse and worse.

Operational costs

The new system exhibited significant performance problems, including slow response time under moderate loads and overnight processing requirements the system couldn't accommodate. Because R was dealing with a mission-critical system, it had to rectify its performance problems. It needed approximately six person-years of effort to resolve the performance issues, adding $480,000 to first-year operational costs.

Many of these performance issues were due to Snidely's failure to denormalize the database design to improve performance. The system as implemented used 4GL technology to handle all the overnight reporting functions, so every report was processed sequentially through the entire database, resulting in operational inefficiencies. In all, the system was a marvelous example of false economy — Snidely saved development costs by using legions of junior 4GL consultants, resulting in the indicated operational inefficiencies. Senior IS personnel at R were able to identify improvements resulting in a reduction of one batch process from 2½ hours to 15 minutes. They were able to speed material handling equipment interfaces by a factor of 500.

R also faced major maintenance problems because programs in the system were excessively complex. For instance, a sample of 10 programs showed unacceptably high McCabe Cyclomatic Complexity scores. Generally accepted norms for quality programs are in the 10 to 15 range; Snidely's Cobol and C programs fell between 251 and 62. Because these programs are so complex, changing them to reflect new business rules will be costly. Complexity also increases the likelihood that these programs will be defect-prone.

R is likely going to have to rewrite the programs to avoid the complexity problems altogether. Preliminary estimates suggest it will require at least 10 person-years of effort, or additional excess first-year operating costs of $800,000.

Many of these performance and maintenance issues are a consequence of the extremely compressed schedule. A realistic, 24-month schedule would have made things a lot easier and cheaper.

A bad deal

Not only did R's cost turn out to be nearly 40% greater than expected but the time required to get the system operational, 24 months, was about what it would have taken to develop the system in-house in the first place. The moral of the story? When you outsource, make sure you:

- Contract for quality, not just speed and cost.
- Manage technology risk. R should have insisted, especially for a mission-critical system, on a contract for performance that included prototypes and performance demos. These cost money but nowhere near the $2 million plus in excess costs incurred by the outsourcing disaster.
- Develop cost and schedule scenarios before signing a contract. If R had done so, the proposed schedule would have been a red flag and the outcome predictable. ■

Gack is an independent consultant specializing in software metrics and information technology process improvement. He is based in Pottstown, Pa. He has 32 years of diverse experience in information systems and has an MBA from the Wharton School.

Escalating out of control

Had the system been developed in-house, the company could have expected a total cost of about $4.9 million. That includes:

Labor: $\left(\frac{325 \text{ months}}{12} \times \$80{,}000\right)$	**$2,160,000**
Support:	**$728,000**
Operations:	**$2,000,000**
Total life cycle cost:	**$4,888,000**

The company expected a seven-year life cycle cost of $5,828,000.

Developer's fee:	**$3,100,000**
Support: (1.3 support people @ $80,000 for 7 years)	**$728,000**
Operations (includes hardware):	**$2,000,000**
Seven-year life cycle cost:	**$5,828,000**

Instead, the system cost $8,068,000.

Budgeted:	**$5,828,000**
Performance improvements:	**$480,000**
Maintainability improvements:	**$800,000**
Excess support:	**$960,000**
(8 support people @ $80,000 for 1 year plus 4 support people @ $80,000 for 1 year.)	
Actual total:	**$8,068,000**

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Moonlighting gets RESPECTABLE

There was a time when moonlighting was taboo. Now, with change engulfing information systems organizations, managers and the managed are accepting it as a way of life.

By Alan R. Earls

"You have to be some kind of masochist to volunteer for more than the normal 9-to-5 commitment," says Rob Fagen, a full-time San Francisco-area information systems professional with two part-time jobs. And he acknowledges there have been times when he's been caught on the "wrong end of a 16-hour day" with deadlines for one or more of his bosses still unmet.

But as the '90s grind on, with major structural changes rolling the IS industry and skewing many once-certain career plans, Fagen is no longer on the lunatic fringe. Indeed, the practice of burning the midnight oil on behalf of additional employers is achieving quiet respectability.

According to Mary Kay Hamm, principal at Romac & Associates, a Philadelphia-based consulting and placement firm, moonlighting has traditionally been seen as the province of a few people with skills that are in demand. "The big demand now is for newer technology, while there is just a minuscule demand for mainframe programming," she says. Specifically, Hamm says, Sybase, Inc.'s Sybase, Powersoft Corp.'s PowerBuilder and C++ are a sure ticket to opportunity.

Chet Roberts, a moonlighter who eventually decided to move into consulting, agrees. "The world is full of generalists," he says, "so you've got to specialize in something."

But some moonlighters tell a different story. On the front lines of a changing industry, they say adaptability and a knack for packaging one's talents can open opportunities, too. In essence, employers face myriad problems — if moonlighters can help, they are welcomed with open arms.

Moonlighter Richard Riggs is a veteran of mainframe shops at many of Philadelphia's Fortune 500 company headquarters. While his full-time work — programming in Cobol and working with database management systems — continues to be in traditional venues, his expertise as a moonlighter has led him to smaller organizations. For example, he has worked with law firms struggling to integrate and network their PC-based office automation tools.

Also stretching his IS background to fit an unusually wide range of opportunities is Layne C. Bradley, a vice president of information technology at Gainsco, Inc., a property and casualty insurer in Fort Worth, Texas. "You can't just hide in the background as a data processing person anymore," Bradley says. In addition to his high-profile role at Gainsco, Bradley heads up a company software subsidiary.

As if that weren't enough, Bradley has sought other opportunities. For example, he has served on the faculty at a local college and worked as a consulting editor

Moonlighting, *page 139*

COMING OUT OF THE CLOSET

Although most moonlighters claim to like their second careers, there is less unanimity regarding what to tell the boss and when.

At one extreme is Gainsco's Layne C. Bradley, who says, "My work is open, and my employer knows all about it." Indeed, he says, the highly visible moonlighting work he does — running a software subsidiary, teaching IS subjects at a local college and writing about IS — have actually enhanced his position and prestige at his regular job. But Richard Riggs, a moonlighter in Philadelphia, says others in IS are constantly asking him the secrets of earning in extra hours. "You can't blame someone who sees that the value of their 40-hour job is X, and they figure they've got extra time they could convert" to more money.

And while honesty may be the best policy, realism seems to temper the behavior of most moonlighters. Howard Tener, chief executive officer at San Francisco-based Tener Corp., a provider of temporary consultants, explains that most employers frown on moonlighting because they expect the primary job to require more than 40 hours. "It would have to be something that doesn't infringe on time available for a regular job," he says. "It should be a company that is in a synergistic business," he adds.

Ray Ashcroft, a Sacramento, Calif., consultant, agrees that realism is a key to survival. Humiliating his own foray into moonlighting, he says there was no way he was going to tell his boss about his after-hours activities. — Alan R. Earls

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Moonlighting

CONTINUED FROM PAGE 138

at Auerbach Publishers in New York. Although his background is in programming, most of his work is more management-oriented. In fact, he says, "I've tried to look at all my skills and find the best way to leverage them." As for the inevitable time conflicts, Bradley says he has never let his teaching and writing work infringe on his daytime responsibilities at Gainsco.

Fagen, for his part, says he offers different skill sets to each employer. For his primary employer, a financial services firm, he provides support in Unix and Informix for IBM RS/6000s. "I also work for a telecommunications company where most of the work is on IBM mainframes and Oracle."

At his second part-time position at a beverage company, Fagen says, "everything is PC-oriented and local-area networks." Balancing those responsibilities and surviving weeks that sometimes require an 80-hour commitment has been made easier by an understanding boss. "My No. 1 job is 40 hours," Fagen says. "But I've been here two years, and they know I will get my work done, so sometimes I shift hours, even leaving as early as noon."

Not for everyone

For those ready to add hours to a regular work schedule, Riggs warns that most moonlighting assignments demand extra communication and people skills. Although his employers tend to treat him as just another member of their technical staff, it isn't like a regular job. "What we do is not a recursive, grind-it-out thing," he says. "More often, it's sitting and working out something to see what is doable." As a consequence, Riggs says, only a minority of IS people are equipped to find moonlighting assignments and succeed at them.

Nor is moonlighting necessarily more lucrative than a regular job. "Often [employers] want a bargain," Riggs says. But as a rule, according to Riggs and Ray Ashcroft, a Sacramento, Calif., moonlighter, after-hours work can net 30% to 50% higher returns on an hourly basis. But don't expect perks.

Charles A. Plesums, a senior director of information technology architecture at Fort Worth-based USAA, a diversified financial services organization, says the biggest misconception about moonlighting is that it's something you can easily squeeze in "after the news at night." But "you've got to be ready to put aside at least 20 hours a week," he says.

Who you know

Riggs says knowing people in the business is key to getting moonlighting work. Timing helps, too. For example, Ashcroft says, "In Sacramento, all the [requests for proposals] coming out of the state of California currently involve Oracle" products, so opportunities in that area have been exploding.

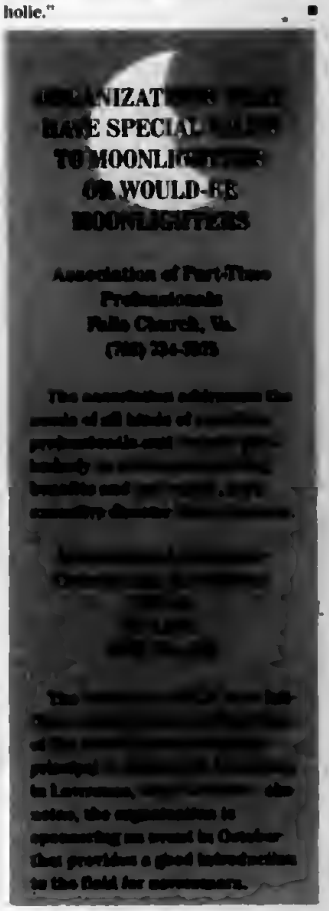
For those determined to build a solid foundation for moonlighting, Hamm suggests trying the "buddy system" to find someone working on a project that might provide moonlighting opportunities. And if there's a chance to pick up new skills, she says, you might even consider doing work for free in exchange for experience.

Means to an end

Of course, all that preparation can pay off in other ways. A good moonlighting job can turn into a good full-time job. Some even find the extracurricular life style of moonlighting so appealing they become consultants.

Roberts, who moonlighted for six years, almost wound up with a full-time job and a consulting practice. "When I told my boss I was leaving to start consulting work, he asked what it would take to get me to stay. I was back the following Monday on contract," Roberts says.

Plesums, who has had more than 30 years' experience in IS, from programming to management, notes that doing extra work on top of an already busy schedule takes a special kind of person. And while many of his jobs are high-level and some involve trips abroad, he isn't averse to helping out local mom-and-pop operations, either. Of course, he adds, "It helps if your spouse is also a workaholic." ■



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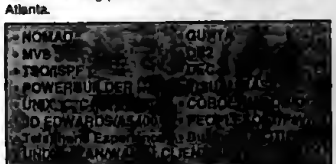

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PROGRAMMER ANALYST (Ref: 97294) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems; develop, maintain, & support an integrated IBM system complex; install, customize and tune SNA wide area network using ACF/VTAM, ACF/NCP generation operation and maintenance; connect IBM PCs and UNIX machines to the IBM hosts to have terminal emulation and file transfer; technically support design and development of applications on IBM 3090 using MVS, CICS, DB2, COBOL, VSAM, TSO, JCL, DOS/VSE, DL/1, REXX, EXEC2, XEDIT, MPSX and Assembler language using OS macros CMS macros and low-level I/O for IBM 33XX DASDs; Reqs. Bach. in Comp. Sci., Computer Engineering, Electrical or Electronic Engineering, Systems Analysis or its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, System Engineer, or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Related exp. must include, in whole or part, system software development using DOS/VSE operating system, Assembler language using low level I/O for IBM 3370, CICS, DL/1, VSAM, SQL/DS, COBOL, REXX, EXEC2, MPSX, XEDIT $42,000/yr 40 hr/wk., 8:30a-5p.

PROGRAMMER ANALYST (Ref: 68394) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems; design & develop Graphical User Interface for an application involving CLIENT/SERVER architecture; application to be put through the System Testing phase using IBM PS/2, C, UNIX platform in C, OS/2-PM software, APIs in DB/2 & DB2/2 environment; Reqs. Bach. in Comp. Sci. Computer, Electrical or Electronic Engineering, Systems Analysis or its equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Software Systems Consultant, Systems Consultant, Associate Systems Engineer, or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Related exp. must include, in whole or part, working on OS/2 platform and Unix platform in C. $48,156/yr. 40 hr/wk., 8:30a-5p Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref # Employer Paid Ad.

Programmer Analyst to analyze, design, develop, implement & enhance UNIX & Windows based software systems/applications for quality warranty data analysis in automotive industry, based on client/server network & distributed databases across different platforms (SUN, DEC, Sequent, IBM PC) using Oracle, Pro*C, C C++, SQL, RPC, Visual C++, X-Motif; design & maintain relevant databases for supporting system/applications; develop & design interface & relevant data structure for systems/applications; test & debug related programs; provide technical support for advanced users; use neural network & artificial intelligence principles to design data analysis interface; use department systems/applications; Reqs: Master's in Comp. Sci. or Comp. Engg., 6 mos. exp. in job offered or 6 mos. related exp. as Research Assist. Related exp. or grad. level research must have involved all the following: programming using C, C++, X-Motif, SUN, DEC, X-Windows, UNIX, IBM PC, RPC Network programming; designing relational database; using Pro*C, SQL, SQL Plus, Oracle utilities & relational & distributed database. Must have 1 grad. level course each in: Computer Architecture, Neural Computers, Computer graphics, Systems Programming, Information Analysis, Artificial Intelligence Tech., $40,000/yr. 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #81794 "Employer Paid Ad"

Systems/Database Administrator to administer enterprise-wide data model & co-administer Novell Netware LAN including performance of database administration functions, development & implementation of refinements to SQL Server database & front-end GUI enhancements, management of LAN management software & assist in providing technical support, user training & troubleshooting, utilizing proficiency in development & administration of LANs based on Novell Netware operating system; load balancing in a distributed processing environment, including Queuing Theory & simulation; design & development of GUI, event-driven & object oriented software; SQL, any CLIPPER-like 3GL relational database language, C & C++. Requires M.S. or equivalent degree in Computer Science & thorough proficiency in development & administration of LANs based on Novell Netware operating system; load balancing in a distributed processing environment, including Queuing Theory & simulation; design and development of GUI, event-driven & object oriented software; SQL, any CLIPPER-like 3GL relational database language, C & C++. Candidates must presently be eligible for permanent employment in the U.S. Salary $33,800 per year/40 hour week plus employee benefit plan. Position is with not-for-profit corporation in St. Louis, Missouri providing services to Catholic health care entities. Send resume & details of proficiencies to Mrs. Jimme Gaston, Missouri Division of Employment Security, Job Order No. 160161 P.O. Box 339, Florissant, MO 63032-0339 EOE. An Employer-Paid Ad.

Scientific Systems/Analyst/Programmer to develop and design computer software using mathematical theories, statistical data and algorithms to create databases for tracking biological data provided by research scientists. Will involve database conversion and neural net technology. Liaison with Ph.D. research scientists to determine software parameters and research needs of scientists before designing and development of software. M.S. in Computer Science or Mathematics plus 1 yr. experience in Systems design/programming in scientific research environment (experience can be obtained while obtaining degree). Must have demonstrated ability using computer language C, and C++ and Pascal. Demonstrated ability to use VAX/VMS, and UNIX Operating System; demonstrated ability to program using parallel processing. $41,472/yr. 40 hrs/wk. Send resume to: D.E.S. Workforce Center, 215 Keo St., Des Moines, IA 50309-1727. Refer to Job Order No. IA 1100290

SYSTEMS ANALYST/ PROGRAMMER (Southfield, MI), 2 Positions. Consult w/multi-divisional co. clients re sophisticated info processing reqmts. Identify problems in info flow & opportunities to enhance info. utility. Perform system analysis & progrmg tasks for design, installation, maintenance & troubleshooting of multiple computer platforms w/on-line & database systems utilizing INFORMIX 4GL database system running under UNIX operating systems & DOS. Design test data suites & conduct compliance testing. Write operations & technical manuals to describe systems functions & features. Train user clients & EDP personnel in operation & technical aspects of systems & programs & provide work docmtn. Exercise technical supervision over 1 or more progrmrs assigned to project. Bach. in Comp Sci or Math + 2-yrs exp. reqd. 40 hrs/wk, 9-5, $42K/yr. Send resumes to 7310 Woodward Ave., Rm: 415, Detroit, MI 48202, J.O. #102384 Employer Paid Ad.

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PROGRAMMER/ANALYST: Design and develop online/realtime information systems using Cobol on a Data General MV30000 minicomputer with AOS/VS operating system. Code, test, and implement such diverse business applications as receiving, shipping, warehousing, distribution resource planning using Cobol. Evaluate study, and recommend suitable RF/ID or bar code systems for automation of warehousing operations. Requires Master's degree in Computer Science or Electrical Engineering. Also requires one year experience in the job to be performed or one year experience as a Programmer. If experience in related field, entire experience must be in the coding, testing, and implementation of an online system for distribution using Cobol on a Data General computer system. Education to include six months research in which the individual developed software simulation and testing of optical scanners or optical filters. Hours: 8:00 a.m. - 4:30 p.m. 40 hours per week to $38,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send two copies of resume to: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, ATTN: Ruth Daniels, Ref #V-IL-11993-Y, No Calls, An Employer Paid Ad

Programmer Analyst to translate written & verbal code specifications into machine readable language to create computer programs using Turbo Pascal & C in MS/DOS & MS/Windows environments, design code & screen resources using various Windows tools; Reqs: Bach. in Comp. Sci., 2 yrs exp in job offered or 2 yrs. related exp. as a Programmer. Related exp. must include developing an inventory database system using Turbo Pascal & C in DOS environment, must have 1 univ. course each in Programming Language, Networking, & Software Development. $29,400/yr 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202 Ref #93894 "Employer Paid Ad"

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PROGRAMMER ANALYST (Ref. #93694) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; DB2 system administration, system programming, design, development, implementation & maintenance of manufacturing financial & engineering applications utilizing software engineering tools & techniques; provide user support & enhance existing software application; install IBM system software products, TSO, DB2, SQL, QMF, SPUFI, MVS Utilities, CICS, ISPF/PDF, CLIST, VS COBOL II, C/370, ASSEMBLER-H, PL/1, FORTRAN 77, JCL under MVS/XA on IBM 3090 platform; Reqs. Bach. in Comp. Sci., Computer, Electrical or Electronic Engg. Systems Analysis or equiv. & 2 yrs. exp. in job offered or 3 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, System Executive, Project Engineer, Scientist Engineer "C" or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Related exp. must include, in whole or part, using DB2 & IBM software products TSO, VSAM, ISPF/PDF, JCL, CLIST, SQL, QMF, SPUFI; installing new system software products on IBM 3090; & using MVS & CICS, $48,300/yr. 40 hr/wk., 8:30a-5p.

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Cashing in on CAPs

A willingness to negotiate with and serve customers is one of the key draws to competitive access providers. On the other hand, while cost savings are competitive, they may not be as much as expected.

By Lyno Haber

Competitive access providers (CAP) have arrived. Since springing up about 10 years ago to compete with the Bell operating companies (BOC), their benefits are beginning to outweigh their risks. Moreover, their core business, which initially provided local access to interexchange carriers, is expanding. The result? Information systems departments are taking notice.

Bob Postoo, manager of communications at BancBostoo Mortgage Corp., had two primary reasons for turning to a CAP: The company's IS departmeot was planning to redistribute its voice oetwork, and it wanted a good deal.

The Jacksooville, Fla., company felt comfortable hiring a local CAP — Intermedia Communications of Florida, Inc. — for network backup about 14 mooths ago. "After an initial trial period of several mooths, we found that Intermedia gives us at least eqoal service to that of our local Bell operating company," Postoo says.

Io fact, as the demands of telecommunications inecrease, more companies will follow suit. According to Datapro Information Services Group in Delran, N.J., approximately 50 CAPs claim about 1% of the total telecom market, and the numbers are growing. "CAPs are getting more customers because the BOCs are bound by the regulatory scene," says Colleen Beck, managing analyst at Datapro. "This ofteo prohibits them from moving fast enough on new technology and services."

Almost all of the 25 multiregional CAPs own their own fiber oetworks, Datapro says. An additional 25 CAPs affer single-city service but resell telephone compaoy capacity.

In terms of service, all provide private branch exchange (PBX) and switched business service. Some offer Ceotrex service, an off-site PBX-like service, and only a few, such as MFS Telecom, Inc. and Teleport Communications Group, offer frame relay and Asynchronous Transfer Mode (ATM).

While companies ofteo enlist CAPs to establish parallel networks in the event of a disaster, a CAP's willingness to negotiate and serve customers is a key selling point. In addition, CAPs offer the following advantages:

▶ **Fiber networks:** Unlike local telephone companies, many of which are still building fiber oetworks, CAPs offer end-to-end fiber. This means clarity, integrity of transmissioo services, security and high capacity.

Phil Evans, director of telecommunications at Perot Systems Corp., for example, reports that the qoality of Perot's fiber-optic network from its CAP is consisteotly high, whereas BOC network infrastructure combines new and old technology and doesn't have the same consisteocy of transmission quality.

▶ **Single focus:** A CAP's sole business is to provide oetwork access and services, onlike some BOCs. "Many BOCs are into financial, real estate or database information processing services in addition to their core telecommunications busioess," says Bernie Walker, a Teleport spokesman.

▶ **Quick service:** As independent companies, CAPs are noi restrained by regulations, which allows them to move and make changes quickly. Stephen Snow, president of Automated Call Processing Corp. in San Francisco, says Teleport not only costs less than his BOC, Pacific Bell, but also provides faster turnaround.

"Teleport focuses oo providing good customer support. When we need installations or service, they're quick to provide it," he says.

▶ **Choices:** Prior to the divestiture and deregulatioo of the telecommunications industry, there were no options, says Pierrette Chabo, director of telecommuoications research at the Business Research Group in Newton, Mass. "Organizations believe that they will get better pricing and service because the No. 2 company, or smaller competitor, will try harder to please," she says.

▶ **Cost savings:** Costs are competitive, hut savings depend oo a number of factors, such as provider, service terms, package rates, volume and distance carried. "Pricing among CAPs varies, but organizations can get a possible 10% savings oo average, compared to going to their BOC," Beck says.

▶ **Electronics packages:** Unique services are ofteo available. For example, Teleport offers LAN-Link for data users, whieh allows for eveo throughput or native speed transmission to a LAN — 10M bit/sec., for example, vs. having to huy subspeed transmission lines. ■

Source: Datapro Information Services Group, Delran, N.J.

Haber is a free-lance writer in Boston.

CAP considerations:

IDENTITY PROBLEMS: Competitive access providers (CAP) are building their reputation by slowly increasing market share and customer acceptance. So far, acceptance by upper management must still be earned. For example, Bob Postoo, manager of communications at BancBoston Mortgage Corp., says that because CAPs were relatively new to the telecommunications market, he contracted with his for a limited amount of business to test its quality. "We wanted to see how well our CAP could provide service before we went ahead any further," he says.

COST: Organizations that turn to a CAP can expect to get about 10% savings, on average. "Cost savings alone is not the reason most organizations turn to a CAP," says Colleen Beck, managing analyst at Datapro Information Services Group.

VENDOR SHAKEOUT: In cities where multiple CAPs compete, analysts predict that not all will survive. "There might be a shakeout in about five years, but customers won't have to worry because they'll see larger CAPs buying out smaller ones," Beck says.

MULTIPLE CAPs: Not all CAPs can service customers in all cities, which may force multisite organizations to deal with several different ones. MFS Telecom, Inc. and Teleport Communications Group, the two biggest CAPs, each service more than a dozen metropolitan areas, whereas most CAPs are multiregional, serving five to 10 cities apiece.

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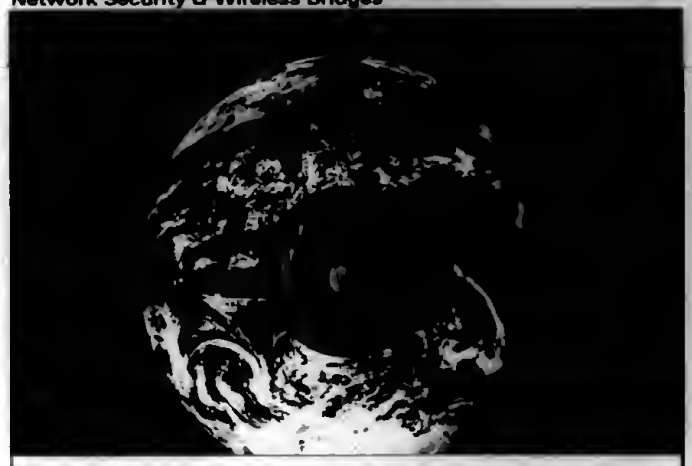

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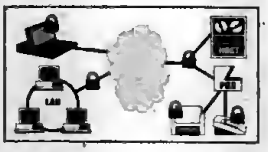

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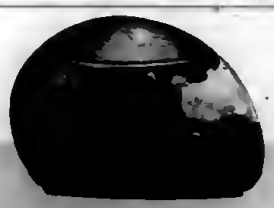

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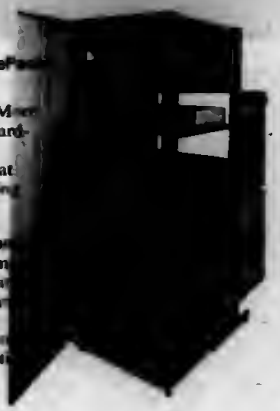

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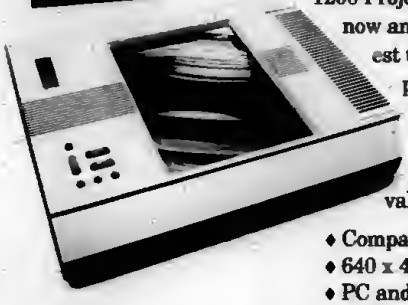

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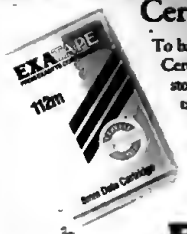

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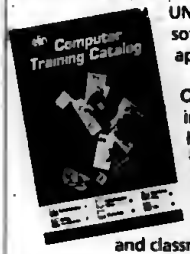

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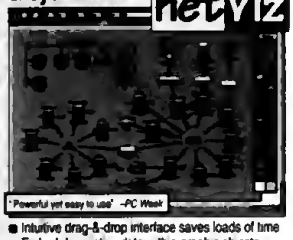

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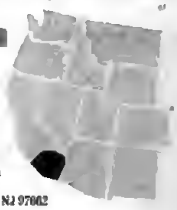

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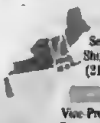

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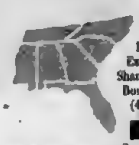

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Sierra Semiconductor (H)	28.4	Zeos International Ltd.	-9.8
Cognos Inc.	18.4	Racotek Inc.	-9.3
General Datacomm Inds. (H)	17.2	Amdahl Corp.	-7.5
Xilinx	16.4	Interleaf Inc.	-6.8
Sapiens Intl. Corp. N.V.	15.4	SHL Systemhouse	-6.8
Computer Network Tech.	13.2	Ross Systems	-6.7
Cirrus Logic	12.2	Wall Data Inc.	-6.6

Dollar

Xilinx	7.13	Wall Data Inc.	-2.50
Cabletron Systems	6.88	Compuware Corp.	-2.25
Sybase Inc.	3.12	Cray Research Inc.	-1.13
SynOpsys	4.50	BellSouth Corp.	-0.88
General Datacomm Inds. (H)	3.63	Nynex Corp.	-0.88
Cirrus Logic	3.38	IMRS	-0.88
Lotus Development	3.38	Informix Corp.	-0.81
Sierra Semiconductor (H)	3.13	Centigram Communications	-0.75

The semiconductor segment led technology stocks last week, with strong finishes from Xilinx, Cirrus Logic and Sierra Semiconductor

[redacted]

Opening the PC floodgates

PC hardware manufacturers are laying plans for the fourth quarter, announcing a slew of new products this fall as they prepare to do battle during the Christmas season (see story page 32). A consensus leader in this sector is **Compaq Computer Corp. (CPQ)**, garnering a Buy recommendation from numerous analysts.

Compaq had high inventory levels in the second quarter and has since had flat levels, which is the company's intended strategy, said Jon van Bronkhorst, an analyst at Robertson Stephens in San Francisco.

Overall, van Bronkhorst expects up to $20 million in PC shipments to take place in the fourth quarter, good news for all players in the market regardless of their strategies and positioning. "If they all capture a little of that they will all do well," he said.

Apple Computer, Inc. (AAL) can compete against other PC hardware vendors because of its name recognition and near-religious customer loyalty. But computer analyst David Wu of S.G. Warburg Research in New York thinks Apple's problem actually stems from Microsoft Corp.

With the introduction of Windows 95, the upcoming release of Windows, Microsoft will finally have a product comparable to the Macintosh, Wu said, leaving a big question mark surrounding Apple shares. "It's a matter of hope and see vs. wait and see," he said.

On the other hand, van Bronkhorst cited Microsoft's slip on Windows 95's delivery date to the middle of 1995 as evidence that the software giant is less of a threat to Apple now.

Dell Computer Corp. will not even compete in retail channels this year, opting to take advantage of growth in the corporate market. Though the company could miss out on part of the consumer boom, analysts said they believe it is a good decision in light of Dell's traditional direct-sales and mail-order business models.

Another vendor, AST Research, Inc., has been hit by hard times recently with poor fourth-quarter results and a product line in need of upgrades, according to Lucianne Painter, an analyst at Salomon Brothers, Inc. in San Francisco. "The vendor that could throw a monkey wrench into the best-laid plans of AST is Compaq," she reported.

The market may also have to look to a well-known adversary for some new competition, according to van Bronkhorst. "IBM will come back from the dead with their new product announcements," he said. "Compaq will see some pressure from IBM." — *Tim Ouellette*

Exch	52-Week Range			Sept. 9 1994	Wk Net Change	Wk Pct Change
Communications and Network Services						UP [illegible]
OTC	34.56	12.25	3COM Corp.	33.19	0.05	-0.1
NYS	49.56	36.25	Ameritech Corp.	40.88	-0.38	-0.9
NYS	91.38	69.50	AT&T	54.00	-0.75	-1.4
OTC	26.38	12.75	Banyan Systems Inc.	19.56	-0.37	-1.6
NYS	69.13	49.00	Bell Atlantic Corp.	52.75	-1.50	-2.8
NYS	93.88	33.00	BellSouth Corp.	57.75	1.50	-2.6
NYS	21.50	8.38	Bolt Beranek & Newman	16.50	0.38	2.3
OTC	15.75	9.00	Brooktrout Technology	10.50	0.50	5.0
NYS	112.50	82.63	Cabletron Systems	108.00	5.25	5.1
OTC	43.00	10.00	Centigram Communications	14.38	-0.63	-4.2
OTC	60.25	31.50	Chipcom Corp.	55.00	-0.50	-0.9
OTC	40.75	18.75	Cisco Systems Inc.	25.31	0.63	2.5
OTC	18.38	9.25	Compression Labs Inc.	11.38	0.75	7.1
OTC	12.38	5.13	Computer Network Tech.	7.38	0.75	11.3
OTC	13.75	8.50	CrossComm	9.38	-0.38	-7.0
OTC	3.00	1.50	Data Switch Corp.	2.44	0.00	0.0
OTC	36.56	17.88	DSC Communications	28.75	0.13	0.4
NYS	74.38	8.25	General Datacomm Inds. (H)	24.25	3.13	14.8
NYS	39.88	29.50	GTE Corp.	30.63	-1.00	-3.2
NYS	95.67	78.63	ITT Corp.	80.75	-0.25	-0.3
OTC	29.63	21.38	MCI Communications Corp.	23.93	-0.75	3.3
OTC	8.25	2.13	Microcom Inc.	7.44	-0.19	2.5
OTC	23.50	11.25	NetManage Inc.	18.00	-0.93	-3.4
OTC	7.25	4.00	Netrix Corp.	5.33	-0.93	10.9
OTC	8.75	3.38	Network Computing Devices	3.38	-0.38	9.7
NYS	14.00	7.38	Network Equipment Tech. (H)	14.00	0.13	0.9
OTC	23.38	11.38	Network General	19.81	0.06	0.3
OTC	8.63	6.38	Network Systems Corp.	8.63	0.38	4.5
OTC	72.25	26.50	Newbridge Networks Corp.	33.88	1.13	3.7
NYS	36.00	23.75	Northern Telecom Ltd.	34.88	0.25	0.7
OTC	26.93	13.38	Novell Inc.	16.00	0.50	3.2
NYS	68.38	33.25	Nynex Corp.	37.38	1.00	7.6
OTC	30.00	15.50	Octel Communications Corp.	23.25	-0.25	1.1
OTC	18.75	8.00	Optical Data Systems Inc. (H)	18.25	0.13	8.7
OTC	7.50	3.13	Penril Data Comm Networks	3.63	-0.13	3.3
OTC	20.75	10.00	Picturetel Corp.	20.13	0.88	3.7
OTC	8.75	2.13	Proteon Inc.	4.13	0.50	13.8
OTC	14.38	2.75	Racotek Inc.	4.38	-0.31	-6.7
NYS	45.00	26.88	Scientific Atlanta Inc. (H)	43.75	-0.13	-0.3
NYS	47.00	36.75	Southwestern Bell Corp.	41.13	-0.25	-0.6
NYS	40.25	31.38	Sprint Corp.	38.00	-1.13	-2.9
OTC	26.75	13.38	Standard Microsystems Corp.	19.88	0.38	1.9
OTC	42.75	11.50	StrataCom Inc.	38.75	1.00	2.6
OTC	35.75	13.13	SynOptics Communications	15.94	0.06	0.4
OTC	15.25	3.88	Telebit Corp.	5.13	0.12	2.8
OTC	40.00	23.00	US Robotics	33.88	0.50	5.5
NYS	50.75	38.25	US West Inc.	39.75	-0.50	-1.2
OTC	43.88	18.75	Wellfleet Communications	22.63	-0.38	1.6
OTC	28.25	12.75	Xircom	19.25	0.75	3.9
OTC	23.00	13.25	Xylogics Inc.	21.75	0.25	1.2
OTC	29.25	11.25	Xyplex Inc.	27.63	9.13	49.3
PCs and Workstations						UP [illegible]
OTC	7.50	2.63	Advanced Logic Research	4.25	-0.25	5.0
OTC	38.50	22.00	Apple Computer Inc.	35.75	0.50	1.4
OTC	33.00	12.38	AST Research Inc.	14.06	0.69	5.1
NYS	39.88	17.59	Compaq Computer Corp.	35.38	0.50	1.4
OTC	36.50	15.13	Dell Computer Corp.	33.69	1.31	4.1
OTC	25.00	6.25	Gateway 2000 Inc.	15.31	1.19	8.4
NYS	93.61	64.38	Hewlett Packard Co.	88.50	0.88	1.0
NYS	26.00	10.56	Silicon Graphics	24.75	-0.75	2.9
OTC	31.38	18.25	Sun Microsystems Inc.	26.75	0.19	0.7
NYS	50.75	30.75	Tandy Corp.	43.38	1.63	3.9
OTC	5.13	2.38	Zeos International Ltd.	2.38	-0.37	-9.8
Large Systems						OFF [illegible]
ASE	10.25	8.38	Amdahl Corp. (H)	9.25	-0.75	7.5
NYS	7.93	4.13	Convex Computer	3.50	1.00	35.4
OTC	4.50	0.30	Cray Computer	1.93	0.00	0.0
NYS	33.75	19.13	Cray Research Inc.	21.25	-0.25	1.2
NYS	10.75	6.63	Data General Corp.	8.00	-0.50	-5.8
NYS	42.88	18.25	Digital Equipment Corp.	24.13	-0.13	-0.5
OTC	9.38	2.38	Encore Computer Corp.	4.00	0.00	0.0
NYS	52.75	39.63	Harris Corp.	47.93	-0.63	1.3
NYS	70.12	41.25	IBM	67.01	0.50	0.7
OTC	18.75	7.75	NetFrame	9.75	0.25	2.6
OTC	26.00	3.88	Parallan Computer	4.38	0.00	0.0
OTC	22.88	5.38	Pyramid Technology	7.50	-0.50	-6.2
OTC	20.00	15.13	Sequent Computer Sys.	17.63	0.00	0.0
OTC	6.84	2.39	Sequoia Systems Inc.	4.59	-0.09	-2.0
NYS	38.63	22.88	Stratus Computer Inc.	37.63	0.13	0.3
NYS	16.38	9.38	Tandem Computers Inc.	14.63	0.00	0.0
OTC	30.00	3.88	TriCord Systems	5.50	0.00	0.0
NYS	16.50	8.63	Unisys Corp.	9.63	0.00	0.0
Software						UP [illegible]
OTC	34.50	16.75	Adobe Systems Inc.	30.25	0.38	1.2
OTC	8.13	4.38	American Software Inc.	4.91	0.13	2.8
OTC	55.75	6.75	Ask Computer Systems	13.88	0.00	0.0
OTC	66.00	37.00	Autodesk Inc.	61.25	0.50	0.8
OTC	3.88	1.75	Bachman Info. Systems	2.25	0.00	0.0
OTC	30.00	20.50	BGS Systems Inc.	24.75	0.75	3.1
OTC	71.00	40.50	BMC Software Inc.	45.63	-0.63	-1.4
OTC	30.75	22.50	Boole & Babbage	28.25	-0.50	-1.7
OTC	18.25	8.50	Borland Int'l Inc.	12.50	-0.38	-3.8
OTC	25.00	6.75	Brock Control Systems Inc.	10.25	0.00	0.0
OTC	4.63	2.38	CE Software	2.75	0.00	0.0
ASE	30.34	6.25	Cheyenne Software Inc.	12.00	0.13	1.1
OTC	14.25	7.38	Cognos Inc.	12.13	1.36	12.6
NYS	44.38	27.38	Computer Associates	40.38	1.00	2.5
NYS	5.38	2.13	Computervision Corp.	2.50	-0.13	4.8
OTC	48.25	31.00	Compuware Corp.	40.25	-0.50	-1.2
OTC	14.00	8.75	Comshare Inc.	12.50	3.38	37.0
OTC	25.00	14.38	Corel Corp.	17.00	0.13	0.7
OTC	2.13	2.38	Easel Corp. (L)	3.88	0.38	14.8
OTC	29.75	13.00	FileNet Corp.	23.25	1.25	5.7
OTC	25.00	3.00	4th Dimension	5.50	-0.13	-2.3
OTC	14.38	7.25	Frame Technology (H)	14.25	0.08	0.4
OTC	11.38	7.00	Group 1 Software	8.00	0.00	0.0
OTC	31.75	6.75	Gupta	10.00	0.38	3.9
OTC	12.00	3.88	Hogan Systems Inc.	7.38	-0.38	6.3
OTC	33.25	16.00	IMRS (H)	31.25	-1.13	3.4
OTC	44.75	11.50	Information Resources	13.63	0.13	0.6
OTC	24.50	14.25	Informix Corp.	22.13	-1.06	[illegible]
OTC	13.25	8.75	Intergraph Corp.	9.25	-0.38	-3.9
OTC	8.75	2.30	Interleaf Inc.	4.38	-0.19	-4.3
OTC	15.30	7.30	Intersolv Inc.	13.00	0.25	2.0
OTC	50.00	27.00	Intuit Inc.	43.00	0.25	0.9
OTC	18.75	2.25	KnowledgeWare Inc.	3.69	-0.25	-6.3
OTC	34.75	17.50	Legent Corp.	23.50	0.90	3.7
OTC	88.50	29.75	Lotus Development	43.13	2.38	5.8
OTC	18.00	6.00	Magic Software Enterprises	10.00	0.25	2.6
OTC	18.50	6.00	Manugistics Group Inc.	8.25	-0.67	-0.3
OTC	7.50	1.88	MathSoft	2.00	0.00	0.0
OTC	11.75	4.50	McAfee Associates	8.75	-0.25	-2.8
OTC	17.25	4.75	Mentor Graphics	8.88	0.00	0.0
OTC	28.63	11.50	Micro Focus	12.88	0.00	0.0
OTC	11.63	4.63	Micrografx Inc.	5.88	0.38	6.9
OTC	59.25	37.13	Microsoft Corp. (H)	57.00	1.13	2.0
OTC	44.38	23.81	Oracle Corp.	42.88	1.25	3.0
OTC	44.75	21.30	Parametric Technology	36.56	-0.06	-0.2
OTC	26.50	13.38	ParcPlace Systems Inc.	21.50	-0.44	-2.0
OTC	48.25	26.00	PeopleSoft	43.13	0.10	0.3
OTC	8.75	5.30	Phoenix Technologies	5.50	0.13	2.3
OTC	69.30	36.00	Powersoft	46.75	1.50	3.5
OTC	39.75	3.50	Platinum Software	6.30	0.00	0.0
OTC	37.13	7.25	Platinum Technology	17.00	1.44	9.2
OTC	60.25	27.00	Progress Software Corp.	32.25	0.75	2.3
OTC	4.13	1.94	Quarterdeck Office Sys.	2.50	0.19	8.1
OTC	28.25	9.50	Rainbow Technologies Inc.	12.75	-0.13	1.0
OTC	10.50	5.38	RasterOps	3.88	-0.25	-6.1
OTC	14.50	2.88	Ross Systems	3.75	0.00	0.0
OTC	28.63	2.25	Sapiens Int'l. Corp. N.V.	5.00	1.75	53.8
OTC	14.61	9.75	Softkey International Inc.	13.25	0.38	2.9
OTC	8.63	3.00	Software Publishing Corp.	4.75	0.25	5.6
OTC	13.00	5.00	State of the Art	6.75	-0.25	-3.6
NYS	35.63	21.75	Sterling Software Inc.	31.13	1.38	4.6
OTC	59.88	6.88	Struct. Dynamics Research	7.75	-0.38	-4.6
OTC	57.00	26.75	Sybase Inc.	49.75	0.15	0.4
OTC	20.38	8.88	Symantec Corp.	13.88	0.19	1.4
OTC	52.75	33.00	SynOpsys	43.50	3.00	7.4
OTC	18.00	11.75	System Software Assoc.	14.50	0.00	0.0
OTC	6.75	3.25	Timeline Corp.	3.63	0.19	5.5
OTC	30.00	11.75	ViewLogic Systems	18.50	0.50	2.8
OTC	23.25	12.00	VMark Software Inc.	19.75	-0.75	-3.8
OTC	13.25	6.00	Walker Interactive Systems	8.63	-0.63	-6.8
OTC	60.00	24.75	Wall Data Inc.	34.00	-2.50	-6.7
Semiconductors						UP [illegible]
NYS	31.75	16.75	Advanced Micro Devices	27.88	0.00	0.0
NYS	33.88	16.38	Analog Devices Inc. (H)	30.38	0.75	2.4
OTC	30.38	10.88	Atmel Corp. (H)	29.75	2.38	8.8
OTC	7.50	3.93	Chips and Technologies	4.13	0.00	0.0
OTC	44.63	24.88	Cirrus Logic	30.63	3.38	10.9
NYS	20.00	13.25	Cypress Semiconductor Corp.	19.25	0.63	3.4
NYS	20.13	13.00	Dallas Semiconductor	15.75	0.25	1.6
OTC	37.75	14.75	Integrated Silicon Systems	26.13	-0.88	-3.5
OTC	74.38	55.88	Intel Corp.	65.63	1.44	2.2
NYS	32.88	17.00	LSI Logic Corp.	21.38	1.00	4.6
OTC	26.75	12.25	Lattice Semiconductor	19.38	1.25	6.8
NYS	44.88	15.19	Micron Technology	39.75	0.25	0.6
NYS	55.75	42.13	Motorola Inc.	52.50	0.25	0.5
NYS	33.00	14.38	National Semiconductor	17.25	-0.13	-0.7
OTC	13.88	4.75	Sierra Semiconductor (H)	13.88	3.13	28.4
NYS	89.50	58.75	Texas Instruments	75.88	-0.13	-0.2
OTC	30.88	9.38	VLSI Technology	12.25	1.00	7.5
OTC	14.38	2.88	Weitek	3.38	-0.06	-1.9
ASE	20.38	4.63	Western Digital Corp.	14.75	0.13	0.9
OTC	59.75	29.00	Xilinx	48.75	7.13	16.4
OTC	88.25	36.30	Zilog Inc.	37.88	0.38	1.1
Peripherals and Subsystems						UP [illegible]
OTC	30.50	16.50	American Power Conversion	18.50	-0.25	-1.3
OTC	26.00	10.38	Banctec Inc. (H)	26.00	1.00	4.0
OTC	7.75	3.25	Cambex Corp.	4.50	-0.13	2.7
ASE	7.38	1.38	Cognitronics Corp.	2.38	-0.13	-5.0
NYS	20.50	9.00	Conner Peripherals	11.50	-0.75	-6.1
OTC	26.40	8.75	Creative Technologies Inc.	18.75	1.00	5.6
OTC	14.00	3.50	Data Race Inc.	4.63	-0.13	2.6
ASE	10.75	4.13	Dataram Corp.	5.50	0.25	4.8
NYS	23.00	12.38	EMC Corp.	17.38	-0.50	-2.8
OTC	9.38	3.13	Emulex Corp. (H)	9.38	0.50	5.6
OTC	23.00	11.75	Evans & Sutherland	12.75	0.50	4.1
OTC	72.38	8.75	Exabyte	18.75	0.75	4.2
OTC	28.50	2.63	Intelligent Info. Systems	4.00	0.31	8.5
OTC	4.38	2.00	Iomega Corp.	3.13	0.28	9.8
OTC	9.75	3.00	IPL Systems (H)	3.88	0.38	10.7
OTC	28.50	13.75	Komag Inc.	23.13	-0.13	-0.5
OTC	8.63	4.25	Maxtor Corp.	4.88	0.13	2.6
OTC	8.75	4.88	Micropolis Corp.	6.63	-0.38	-5.3
OTC	37.50	10.25	Pinnacle Micro Inc.	12.13	0.13	1.0
OTC	20.25	6.50	Printronix Inc. (H)	17.00	1.50	8.1
NYS	11.75	6.88	QMS Inc.	9.88	-0.13	-1.3
OTC	20.25	9.38	Quantum Corp.	15.75	0.75	5.0
OTC	10.00	7.25	Radius Inc.	10.00	0.00	0.0
NYS	17.75	6.75	Recognition International	7.13	-0.25	-3.4
OTC	6.88	1.93	Rexon Inc.	5.00	0.00	0.0
OTC	28.75	16.75	Seagate Technology	24.50	1.25	5.4
NYS	41.50	23.75	Storage Technology	36.75	0.75	2.1
NYS	34.63	21.38	Tektronix Inc. (H)	34.38	0.63	1.9
NYS	100.38	60.88	Xerox Corp.	100.00	-0.50	-0.8
Services						UP [illegible]
OTC	27.25	15.13	American Mgmt. Systems	23.75	1.50	6.9
NYS	4.25	2.50	Anacomp Inc.	2.88	-0.13	-4.3
OTC	23.38	14.50	Analysts Int'l.	14.75	0.00	0.0
NYS	56.88	47.63	Auto. Data Processing	53.75	0.00	0.0
OTC	18.25	11.25	Cambridge Tech. Partners	15.75	0.44	2.9
NYS	27.50	10.63	Ceridian Corp. (H)	26.50	-0.38	1.4
NYS	24.25	14.25	Comdisco Inc.	21.75	-0.13	-0.6
OTC	12.50	0.50	Computer Horizons	19.00	0.38	0.0
NYS	45.25	29.38	Computer Sciences	44.13	0.13	0.3
NYS	10.38	6.38	Computer Task Group	9.75	0.00	0.0
NYS	32.00	6.75	CompUSA Inc.	9.00	0.63	7.5
OTC	33.13	6.38	Control Data Systems Inc.	7.25	0.13	1.7
OTC	11.00	6.13	Egghead Discount Software	7.25	-0.13	1.6
NYS	38.00	26.38	General Motors E (EDS)	36.88	0.50	1.4
OTC	21.00	7.25	Inacom Corp.	9.63	0.00	0.0
OTC	28.00	15.63	Intelligent Electronics	15.63	0.50	3.3
OTC	22.50	7.00	Merisel	8.75	0.00	0.0
OTC	32.50	9.25	MicroAge Inc.	11.00	0.00	0.0
OTC	40.50	20.50	[illegible]	[illegible]	0.50	[illegible]
NYS	39.88	22.25	Policy Management Sys. (H)	38.38	1.38	3.7
NYS	20.25	18.63	Reynolds and Reynolds	25.75	0.38	1.5
OTC	28.50	17.00	SEI Corp.	22.00	0.00	0.0
OTC	29.38	20.88	Shared Medical Systems	25.50	0.50	2.0
OTC	11.00	4.38	SHL Systemhouse	6.06	-0.44	-6.7
OTC	26.25	9.25	Software Spectrum Inc.	12.75	0.00	0.0
OTC	62.75	31.50	Sungard Data Systems	34.00	-1.13	-3.2

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385697. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1994 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $6.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $150 (surface) a year; Europe — $195 a year; all other countries — $295 a year. Subscriptions call toll free (800) 669-1002. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2004, Marion, OH 43305.

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Symmetrical multiprocessing

Bull beats IBM to PowerPC punch

By Jean S. Bozman

Bull HN Information Systems, Inc., which helped IBM develop a four-way symmetrical multiprocessing (SMP) server in its RS/6000 Unix line, may actually beat IBM to market by announcing the PowerPC machine next week.

Bull will introduce its version of the Pegasus server, based on four PowerPC 601 RISC chips and IBM's AIX 4.1 Unix operating system, a Bull spokesman said last week.

Bull and IBM began working together two years ago to develop the PowerPC-based SMP design, said Peter Berkel, Bull's director of analyst relations. Based in Billerica, Mass., and Louveciennes, France, Bull did much of the systems integration work, he said.

Both IBM and Bull said separate announcements were in the cards all along. "We cooperated very well on the development," Berkel said. "But in terms of going to market, we will each go our own way."

Sources close to IBM said its SMP server announcement may come as soon as Unix Expo early next month.

But IBM has already faced embarrassing delays with the Unix SMP server. The computer giant is also the last major Unix player to market an SMP version of its Unix-based RISC machine [CW, Feb. 7].

AIX 4.1 must be tuned to provide efficient SMP servers for IBM, analysts said. More AIX 4.1 revisions are also expected by Bull. "AIX was tweaked, twisted and developed to work on SMP, but it doesn't necessarily optimize it," Berkel explained.

IBM may also anticipate using the more powerful PowerPC 604 chip next year, said Terry Bennett, director of technical systems research at Computer Intelligence/InfoCorp in Beaverton, Ore.

Roy Dodd, MIS director at The Good Guys, Inc., a specialty electronics retail chain in Brisbane, Calif., said he has been waiting for the IBM SMP servers to do data warehousing for decision-support applications. "I want to have one image of AIX, and I want to be able to do parallel processing," he said.

It's coming . . .

In August, IBM announced the AIX 4.1 operating system, which supports SMP servers, but said its PowerPC-based Unix SMP servers would not be announced until later this year.

DB/2 tied

CONTINUED FROM PAGE 1

bring IBM "up to par" on functionality with vendors such as Oracle Corp. and Sybase, Inc.

The power of the mainframe behind DB2 should help the database retain its appeal with customers as the new features become available, Nayar added. "IBM is catching up to the rest of the world, but DB2 has throughput like nobody else does, and you need that first and foremost," she said.

"I like the direction that IBM is headed in" with DB2, agreed an executive at a large insurance company in the Midwest. "But I just wish they would move a little faster on some of these requirements." The 1995 delivery schedule for Version 4 is disappointing, said the executive, who asked to remain anonymous.

The insurance company especially needs the row-level locking feature that will be part of the new release. It is running applications that use DB2 for both transactions and querying simultaneously, but queries can "lock up the entire database and lock out the transactions" for several minutes at a time, he noted.

The company has mitigated the problem somewhat by changing the applications, but that "is not the preferred method" for dealing with the problem, the executive said. "We'd rather have it resolved within the database, and row-level locking is a step in that direction."

Controlled rollout

IBM officials confirmed that the release will be introduced Sept. 27. Beta testing is expected to start late this year, to be followed by limited shipments in the first quarter of next year and general availability next spring, said William Reedy, director of product marketing and merchandising at IBM's Large Scale Computing division in Hopewell Junction, N.Y.

DB2/MVS Version 4 is a key product for the parallel System/390 machines IBM introduced in April, Reedy said. With support for sharing data among processors, Version 4 will be the first DB2 release to run on the air-cooled parallel systems, which IBM is counting on to revitalize mainframe sales.

However, analysts familiar with IBM's development plans said they are not expecting any major surge in DB2 use, despite the improvements on the way.

No changes here

While Oracle and other Unix database vendors have been sharply reducing their prices, analysts said they are not expecting IBM to follow suit with DB2/MVS. But a price increase is also seen as unlikely with Version 4 — a switch from IBM's past practices, they added.

Playing the game

Version 4 will give IBM the functionality "on which it's being beaten by Sybase or Oracle" now, said Bhaka Atre, president of Atre Associates, Inc. in Port Chester, N.Y. But she added that DB2 demand "has stabilized along with the mainframe business."

"I'm not looking for increases in [DB2] licenses," agreed Nagraj Atur, a principal at Database Associates International in Morgan Hill, Calif. The database's market share penetration "is at a steady pace right now," and Version 4 will not likely change that, Atur said.

Atre noted, however, that a more competitive DB2 on the mainframe could help IBM hold on to customers while it continues to improve the versions of the database that it has introduced during the past two years for the AS/400, RS/6000 and PS/2 lines.

TCP/IP support was added to the other versions of DB2 earlier this year as part of IBM's Distributed Relational Database Architecture, Atre noted. Making it available with DB2/MVS should make it easier for users with multiple IBM platforms to tie them all together, she said.

Stock exchange trades up

CONTINUED FROM PAGE 1

mum the exchange can trade today is 1.4 billion shares a day, she said, though its average is just 300 million. That volume is a third higher than it was two years ago, however.

Another reason the Big Board swapped out its point-to-point Ethernet backbone for fiber was "to provide users with additional services" such as the integration of voice, data and video communications among traders, said Kinney, who is overseeing the project.

New computing services

The NYSE project, known as the Integrated Technology Plan, also includes a revamp on the computing side of the house. This part of the plan includes a new Unix-based brokerage system running Hewlett-Packard Co.'s HP/UX operating system, which will replace an Intel Corp.-based platform.

The exchange will also eventually roll out a cellular telephone service from Nynex Mobile Communications Co. that will allow brokers to communicate from the trading floor with their firms' booths.

The price tag for the two-year plan is $125 million. This is in addition to the $1 billion that NYSE has invested in technology in the past 12 years.

The exchange's systems upgrades come at a critical time. The Big Board is engaged in a fierce market share battle for customers with electronic trading rivals such as the NASDAQ stock exchange, which is in the midst of a three-to-five-year, $175 million systems overhaul.

Furthermore, the upgrades are expected to help brokerages meet the Securities and Exchange Commission's so-called T+3 mandate. T+3, scheduled to take effect on June 1, 1995, requires securities transactions to be settled within three days instead of five (see story page 47).

Bill Anderson, chief information officer at Prudential Securities, Inc. in New York, said NYSE's systems initiative, particularly the wireless-based order-processing system, should be helpful to his organization. "The majority of the floor brokers are eager to assist anything to speed the process up," Anderson said.

FDDI-based network

The exchange's new network is based on Fiber Distributed Data Interface (FDDI) and incorporates Ungermann-Bass, Inc. terminal servers and hubs along with Wellfleet Communications, Inc. routers.

Kinney said the network will remain viable for the next three to five years, by which time 100M bit/sec. technologies such as Asynchronous Transfer Mode systems and corresponding standards will have matured.

NYSE New York Stock Exchange

Analysts agreed.

"For customers who need high-speed networking solutions in the near term, they can either go with LAN switching or FDDI," said Chip Pettirossi, a senior analyst at International Data Corp. in Framingham, Mass.

The network, which NYSE began implementing in May, will be in place by year's end. Services to take advantage of the increased bandwidth, however, will take a little longer.

The network will eventually support data, voice, video and currency conversions. By the end of next year, several hundred X terminals on the trading floor will be connected to the fiber backbone, providing some 80% of the FDDI services, according to Joseph Kubat, a vice president responsible for trading floor systems at Security Industry Automation Corp. (SIAC) in New York. The company handles information processing for both NYSE and the American Stock Exchange.

Choosing X

During the past year, NYSE has been testing color flat-panel X terminals that were jointly developed by PixelVision and HP. X terminals won out over PC's and workstations because of their reduced space requirements, improved security and easier systems administration, NYSE and SIAC officials said.

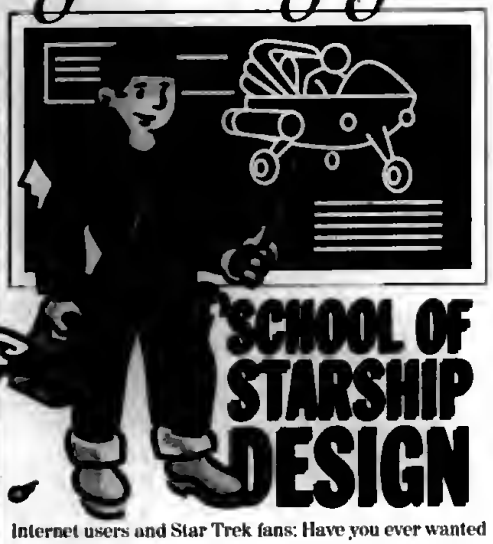
The remaining 20% of the FDDI connections will be made in 1996, when NYSE expects to roll out wireless data devices for floor brokers to both receive orders and send reports from the trading floor.

Wysiwyg

Here's a way to recycle that old PC...

Paula Gulak of Glen Allen, Pa., became champion PC thrower at the first PC Pitching contest sponsored by Inacom Corp. in Omaha. Gulak used a "PC clone" (re: muscular man) to achieve a distance of 137.4 ft. Each contestant in the competition had two chances to throw a PC across a parking lot, with judges measuring total distance and scoring on originality and destructiveness. Some contestants resorted to outright bribery during the contest, handing out free T-shirts, hats and back massages to the judges. Naturally, speculation surfaced that PC Pitching could become an Olympic event at the 1996 Games in Atlanta.

WYSIWYG compiled by Tim Ouellette. Illustration & Design by Dave Marshall.



Internet users and Star Trek fans: Have you ever wanted to build your own starship? Then check out the Starship Design Home Page, from the (definitely not accredited) Lunar Institute of Technology. The School of Starship Design is soliciting charter members to help build the school and its courses. Currently available are frequently asked questions on different aspects of the science and engineering of starships, including speed of light, gravitational radiation and fission rockets.

Source: O'Reilly & Associates' Global Network Navigator

But will cats like it?

Tired of hunching over a laptop, typing away? American Business Concepts in Addison, Texas, has come up with the answer: the Laptop Desk. The ergonomic, adjustable desk includes a tiltable laptop table, a halogen light, an adjustable copy holder, two organizer shelves, a printer shelf and an enclosed cable compartment. The desk doubles as a mobile reading table and can be adjusted to work with any chair.

Inside Lines

Road warriors power up

Pentium is coming to the notebook. On Oct. 17, Intel will unveil its first notebook-specific Pentium chip, a 50-MHz/75-MHz version with special packaging to reduce heat generation, according to industry sources. Toshiba America Information Systems will announce the first notebook based on the chip on the same day, said sources close to the company. The packaging issues will prevent companies like Compaq, IBM and others from using the new Pentium in notebooks right away, though.

Do you know my name?

Brad Boston has replaced Robert Bruce in the top IS post at American Express' Phoenix-based operation. Last week, a company spokesman confirmed Boston had assumed Bruce's former title of senior vice president of information processing and telecommunications. He also confirmed that the company's IS organization is in the middle of a major reorganization, the details of which have yet to be finalized.

Omniphone

Tired of phone tag and fax hell? Next Monday, Hewlett-Packard will announce OmniShare, a $2,595 product that leverages AT&T Paradyne's VoiceSpan technology to allow users to share documents while talking on the phone, according to documents obtained by *Computerworld*. The device is based on a Cyrix 33-MHz 486SX chip and comes with Microsoft's Windows 3.1 with pen extensions.

All dried up

Lotus has stopped leaking things about its progress on wireless Notes because it basically ran out of things to leak. The company acknowledged last week that it has shelved its research project on how to make Notes work in the wireless world. Chris Wraight, Lotus' director of marketing mobile computing, downplayed the effort by saying, "It was just an R&D effort, never a committed product."

Dirty pool

NexGen, the first Pentium clonemaker, is getting better than expected yields from IBM's fabrications, according to a source close to the companies. However, the source says NexGen is sticking a 100-MHz label on a chip that runs no faster than 93 MHz.

One step back, two steps forward

Microsoft has pushed back delivery of its M7 beta of Chicago (now known as Windows 95) from early October to early November, according to some users briefed last week. The delay may give Microsoft added time to put in some promised capabilities not in the current M6 beta version. Those features include support for Silicon Graphics's OpenGL libraries as well as support for Radish, Inc.'s voice-view fax/modem capabilities. This capability lets users use their computers for voice and fax functions simultaneously over a single line.

Epson looks alive with ActionNote

Epson America today will release the first notebooks that use Cyrix's 3.3V 66-MHz 486DX2 processor. ActionNote 766 weighs 4.9 pounds, has 8M bytes of RAM and either a 260M-byte or a 340M-byte hard drive, as well as a built-in 14.4K bit/sec. modem and one Type II PCMCIA slot. ActionNote costs $2,999 with a 9½-in., dual-scan, passive-matrix color screen and $3,999 with a 8½-in. screen.

Amber Wave Systems in Acton, Mass., has quietly canceled a press conference at Networld/Interop '94 to announce a low-cost LAN switching hub (see page 12). A spokesperson said the briefing was "canceled due to a lack of staffing." At the biggest networking trade show of the year? "Incredible!" one analyst said. "I think lack of interest was more like it." Computerworld *is interested in any news items or tips you want to call into our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

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